

24
TREATISE
ON THE
YELLOW FEVER,

AS IT APPEARED IN THE
ISLAND OF DOMINICA,
IN THE YEARS 1793-4-5-6;

TO WHICH ARE ADDED,
OBSERVATIONS
ON THE
BILIOUS REMITTENT FEVER,
OR
INTERMITTENTS, DYSENTERY,
AND SOME OTHER WEST INDIA DISEASES;

ALSO,
The CHEMICAL ANALYSIS and MEDICAL PROPERTIES
OF THE
HOT MINERAL WATERS
IN THE SAME ISLAND.

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EDINBURGH.

PRINCIPALIS OBSTA.

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DEDICATION

TO

MAXWELL GARTHSHORE,

M.D. F.R.S. AND S.A.

AND

**Member of the College of Physicians of London, and F.R.S.
and College of Physicians of Edinburgh, &c. &c.**

SIR,

YOUR long and steady Labours
for the Advancement of the
Practice of Physic in general, and
the great Attention you have shewn
to Persons employing their Time
for the Improvement of Medicine
in tropical Climates, encourage me
to address to you the following
Treatise on the Yellow Fever, and

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some

DEDICATION.

some other Diseases of the West Indies; and at the same Time I embrace the Opportunity of acknowledging, in a public Manner, the Obligations I owe to you for your Politeness and Friendship to me on all Occasions.

I have the Honour to be, with great Esteem,

S I R,

Your much obliged

and very humble Servant,

JAMES CLARK.

LONDON,
30th December 1796.

P R E F A C E.

THE following Observations on the Yellow Fever, which broke out in the West Indies in the Year 1793, are solely founded on the experience I have been able to gain, during an extensive practice in the island of Dominica.

With a view to avoid relating any thing which is not derived from my own experience and judgment, I have been cautious not to peruse any of the publications which have appeared on the same subject: and I feel a satisfaction in affirming, that the care and attention I bestowed on this disease for three years, whilst it raged with the most dreadful violence in all the West India islands, have not been bestowed in vain; the Method of Cure and Prevention here recommended, having been attended with very great success during the above period.

The observations on the Bilious Remittent Fever, on Intermittents, Typhus Fe-

ver, Dysentery, Dry Belly-ach, Cholera Morbus, and the Tetanus, which follow in this Work, are the result of twenty-five years constant practice in the West Indies; I therefore flatter myself that they will prove useful to young and unexperienced practitioners in that quarter.

I entertain the highest opinion of the merit and utility of the works of many of the medical gentlemen, who have published on these diseases; but as in the former case, I have avoided quoting or taking notice of their practice, from the same desire to publish only what has occurred to myself in the history and treatment of them, during so long a residence in that climate.

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CHAPTER I.

SECTION I.

*History of the YELLOW FEVER, in the
Island of Dominica.*

BY the prodigious influx of emigrants from the island of Martinique to the town of Roseau in this island, about the 10th June 1793, the streets and houses were very much crowded. The number of people that arrived here in the course of three days, to avoid the cruelty and persecution of their countrymen, could not be ascertained exactly, but it was estimated at between three and four thousand. These people were brought over in small vessels, exposed to the weather, and in want of almost every necessary of life. They were not sick on their arrival, and this fever had not made its appearance in Martinique when they left it, as many of the most respectable amongst them declared to me.

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In a few days after their arrival, viz. the 15th June, this Fever first broke out, and the first victim to it was an English seafaring man, aged about forty, who had only been a fortnight on the island, and had never before been in the West Indies. Some days after, many of the sailors on board the ships in the Road were attacked; and then the unfortunate emigrants were the next sufferers. From the 1st July to the 1st October it was computed that eight hundred emigrants, including their servants and slaves, were cut off by this fever; and about two hundred English, including new-comers, sailors, soldiers, and negroes, also fell victims to it, in the same space of time. Few new-comers escaped an attack, and very few of these recovered. It spared neither age nor sex among the Europeans and emigrants who arrived, and not only the people of colour from the other islands, but the new negroes who had been lately imported from the coast of Africa, were all attacked with it. I knew a lot of twenty-four fine healthy new negroes all seized with this fever about the same time,

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one third of whom died in the course of the disease. The negroes who had been long in the town, or on the island, escaped; I only recollect one exception, which was in a negro who had undergone very great fatigue, and had been much exposed to the heat of the sun during a long journey.

Many emigrants fled from this island; but, alas! it was to fall a sacrifice to the same disease that now prevailed in every island. It appeared a few weeks earlier in Grenada and St. Vincent than it did in this, as we heard afterwards; and to the former it was supposed to have been brought by a Guinea ship with negroes from the island of Bullam, on the coast of Africa, and was therefore called the Bullam Fever. It was a few weeks later before it reached Antigua, and the rest of the Leeward Islands; but all partook of its ravages during the autumnal months, and even till the month of December and January following.

During these months it also raged in Philadelphia; where, in the space of three months

only, four thousand citizens were cut off by it. It broke out about the same time at Jamaica and St. Domingo, from the latter of which islands the contagion was supposed to have been brought to the town of Philadelphia.

This Fever became less violent here in the month of October, and about the beginning of November it ceased altogether, which was supposed to proceed from the comparative coolness of the weather; but the arrival of some American vessels, about six weeks after, convinced us that this short respite was more owing to the want of proper subjects for the vitiated atmosphere to act upon, than to the change of its temperature; for in a short time all on board, who had not been in the West Indies before, were seized with it, and although the mortality amongst them was not so great as it had been, yet many died. This happened in December 1793, and January and February 1794. From this time till the month of July few cases occurred, and most of these recovered; and even in the following autumnal months the mortality

talities was not near so great as in the former year.

After the 10th October 1794, when Ber-ville camp in Guadaloupe, surrendered, the emigration from that island commenced, and in a few weeks the town of Roseau was nearly as much crowded as it had been in June 1793. This fever did not appear among these people until the 10th of November, and although many of them died, it was by no means so fatal as before, nor did it last more than two months.

From the middle of January till July 1795 it disappeared; and even during this autumn only a few sailors, from irregularity of living, were attacked, and two cases only occurred in November: since which time to the 12th of June 1796, when I left the island, not a single case of this disease had occurred. The autumnal season, however, was then to be dreaded.

I find from my correspondents, that this fever has followed nearly the same course in all the leeward islands; only that it has been

rather more violent, and continued longer, in this, owing perhaps to the town being so much crowded by the frequent emigration of the French from the islands that were situated near to us.

SECTION II.

The Symptoms.

THIS Fever sometimes begins with a slight rigor or chilly fit, rarely with shivering, succeeded by a violent head-ach and vomiting; but more frequently it comes on with lassitude, inclination to vomit, uneasiness at the pit of the stomach, and a severe pain in the back and forehead. The first attack is generally in the night, or towards morning; and very soon after, the eyes appear much inflamed, the face remarkably flushed, and an uncommon redness about the neck and breast succeeds. They cannot bear the light; but turn their faces from it, or cover their heads, and avoid it by every means.

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The fever comes on generally without any previous indisposition, seizing the patient in a very sudden manner; but some complained of lassitude and head-ach the day before. The pulse seldom beats more than 90 in a minute; and the heat was never so great as it is in the hot fit of an intermittent. The sick had not much desire for drink, and the tongue was not foul or white. What was vomited up during the first twelve hours, was only the contents of the stomach before, or what had been drank after the first attack. Bile was seldom discharged till eighteen or twenty-four hours after the first seizure; but about that time or soon after, it became of a deep yellow colour, then green, and gradually darker, till at last the black vomit made its appearance; which happened in a few cases as early as in thirty-six hours, most commonly in forty-eight, in some not till the third or fourth day, and even as late as the fifth or sixth, although this occurred rarely,

The head-ach was of a peculiar kind, being intirely confined to the lower part of the forehead, the eye balls and their sockets. There was a remarkable inflammation in the tunica adnata, and flushing of the cheeks. An hæmorrhage from the nose during the first twelve or eighteen hours seemed to relieve the head-ach, and some recovered after this symptom appeared; but if it did not come on before forty-eight or seventy-two hours, the disease proved fatal. Strong athletic people had generally some degree of delirium during the febrile stage, and some became quite outrageous. Women and delicate people were much dejected, and had a melancholic sort of delirium; but all were prepossessed with an idea of dying from the commencement of the disease. Their most uniform and constant complaint was want of sleep; they never even dozed during this stage, as is usual in other fevers. They all complained of pain and uneasiness about the epigastric region; and frequently the liver seemed to be enlarged and hard, and pressing upon it occasioned considerable pain.

Obstinate

Obstinate costiveness constantly prevailed, and the common doses of purgatives had no effect whatever. The skin was generally dry, and the heat of the body not much above the natural standard: the urine was not high coloured as in the bilious remittent, or intermittent fevers, but after the febrile symptoms disappeared it generally became yellow, or of a dark brown colour. The flushing of the face and the inflammation of the tunica adnata began to abate before the yellowness about the neck appeared, this being the first part of the body that turned yellow, and the eyes were soon after tinged. These appearances, together with an abatement of the febrile symptoms, finished the first or *febrile stage* of the disease.

As the life of the patient depends almost entirely on the treatment during this stage (for few have recovered if this was neglected or ill treated) it is of the utmost consequence to pay attention to the most distinguishing or true characteristic symptoms of this fatal disease. These are chiefly, an extraordinary flushing of the face, redness of the eyes, violent

lent pain in the eye-balls and round the lower part of the forehead, dry skin, a full, soft pulse, not much quicker than natural, and the heat, upon touching the body, found not to be so great as the external appearances would lead us to expect.

For the first three months that this fever raged in Dominica, these were the symptoms by which it was distinguished; but the following year it did not put on such remarkable diagnostic appearances. The flushing of the face, redness of the eyes, head-ach, &c. were less observable, and the feverish period was not so soon over. They had no chilliness on the first attack, the pulse was full and soft, they had a slight delirium, the yellowness did not appear before the fifth day, and many recovered.

There were a few exceptions to this account, but this was the state of our patients in general; and the only difference from the symptoms of the former year appeared to consist in the less degree of violence. An

hæmorrhage from the uterus often occurred, the menstrual discharge was generally excessive, and was always a symptom of great danger.

About the close of the febrile stage, there was often a violent hæmorrhage from the nose, which was a bad sign; as was a delirium first coming on at that time. In the space of twelve hours after the yellowness of the neck, breast, and eyes came on, and the pulse became slow, and the heat of the body natural, the black vomit made its appearance, unless a plentiful perspiration had been brought on by medicine, and the vomiting put a stop to, or the mouth affected with mercury administered early in the disease.

This interval may be termed the *middle stage*. In some it was very short, and then the disease proved fatal; if it was protracted to the third day, and the vomiting subdued, the patient generally recovered. But to those unacquainted with the disease, the symptoms at this period are very fallacious;

fallacious; the pulse being quite slow, the heat of the body natural, the tongue clean, and sometimes moist; and if the patients are asked how they do? they will reply, very well. And as they cover their faces to avoid the light, a practitioner might be deceived if he did not inquire more into their real situation, and uncover their faces; for from the peculiar appearance of the countenance much is to be learned in regard to life or death in this disease.

The bleeding at the nose now became more violent, and was stopped with great difficulty; the delirium and anxiety increased, some being quite outrageous, and others despondent, muttering and moaning to themselves; and some having a placid, but unnatural smile on their countenances, complaining from time to time of a pain about the epigastric region, and vomiting soon after very dark yellow or green bile. In many, a sort of imperfect hiccup came on about this time; the prickly heat or musquito bites on the body; and the elbows, from leaning on them in
the

the act of vomiting, became of a scarlet red colour, and the appearance of the true skin on the removal of blisters was the same. Some roared with a wild tone of voice, shocking to the by-standers, fixing their teeth, and refusing to take either drink or nourishment.

Extreme restlessness, and anguish generally precede the black vomit, which may be styled the *putrescent stage* of the disease. The hiccup becomes now more evident, and the scarlet coloured spots on the skin and the parts that had been blistered put on a pale purple hue. In some, blood issued from the tongue; and the hæmorrhage from the nose, in those who had had it before, increased to a great degree, and contributed to shorten the period of the poor sufferer's life. What was vomited up at this time, resembled grounds of coffee, and seemed to be small particles of black bile mixed with a ropy mucous fluid and the contents of the stomach.

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The quantity of this black fluid, that was thrown up, is really astonishing. As the disease advanced, it became thicker and darker, till at last it resembled the meconium of new born children; the stools also became black, and had much the appearance and consistence of tar. The hiccup became more violent and more frequent, and a total suppression of urine came on. This symptom appears to proceed from a total cessation of the urinary secretion, as attempts have been made to draw off the urine by a catheter but without effect; the bladder having been always found quite empty. If the urine had been passed in small quantities at a time during the febrile stage, and tinged the linen yellow at the commencement of the second, it was a bad sign, and few that had this recovered. I never observed bloody urine; and no blood was ever vomited up or passed by stool, except what seemed to have been swallowed by those who had a violent bleeding from the nose, which was not a constant symptom. After vomiting up a quantity of the black matter, the patients always seemed to
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be relieved for a short period from that excessive torture that they felt at the pit of the stomach; but on attempting to drink, the same pain returned, and no liquid could then be retained for a moment on the stomach. They had no difficulty of respiration; but great anxiety and oppression about the præcordia, and sometimes a tension over the epigastric region, but rarely any distention of the abdomen. After this the patient began to sink fast, the pulse being now under 60 in a minute and the heat greatly below natural.

I never observed cold clammy sweats in this disease, which happen so often in the last stage of the bilious remittent fevers of these islands, when they prove fatal. Nor have I ever observed subfultus tendinum, which is also so common in the last stage of other fevers.

The debility was now so great, that the pulse often ceased to beat, while the patient was vomiting, and the colour of the neck, arms, and legs became quite livid. Some were

were delirious at this time; but all were extremely restless, sighing, and tossing about, till a general convulsion closed the distressing scene. These were the symptoms amongst young people; but the old and infirm generally fell into a torpid comatose state, *after the febrile stage was over*, moaning and sighing till they expired without a struggle. This shocking stage of the disease continued generally about twenty-four in some thirty-six hours; but in others the progress of it was so rapid that the patient expired in a few hours after it began.

When the disease finished its course in seventy-two hours, the different stages followed one another in such a rapid manner, that it was scarcely possible to distinguish them. It was protracted in general to the fifth day, in some to the seventh, and in a few instances to the eighth or ninth, before death took place. In one patient the yellowness continued till the thirteenth day, and as he retained medicines and nourishment on his stomach, and a number of boils

boils broke out on his face, head, and neck, we entertained hopes of his recovery; but the nurse having neglected to administer bark and nourishing cordials as directed, some of these boils became gangrenous, and he expired in a convulsion the fifteenth day of the disease.—In many this putrid tendency was so far advanced, before we were called to the sick, that no medicine or any application whatever seemed to have any power or effect in checking its progress towards a total dissolution.

SECTION III.

The Prognostic.

WHEN the practitioner was not called in during the febrile stage, or until the black-vomit and other putrid symptoms had appeared, which happened to be too often the case, it was no difficult matter to pronounce with certainty the fatal event of the disease.—In general few recovered who had a cold fit at the beginning of the fever.

If the yellowness appeared in twenty-four

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or thirty-six hours after the first attack, when the case had been left to nature, or the patients had been bled, and no powerful remedies attempted, they never recovered.—Or whether the yellowness appeared or not, if the fever left great languor and debility, there was no expectation of a recovery.—The sooner the febrile stage ended, when the case was left to nature, or only simple remedies were used, the greater the danger; and, on the contrary, the sooner the fever was subdued by powerful remedies acting in an evident and decisive manner, the greater chance the patient had to recover.—If the debility was not great after the fever, and the yellowness did not appear before the fourth or fifth day, the sick generally recovered.—Many also recovered after the yellowness, and even after a violent bleeding at the nose had begun; but in all my practice I only recollect four patients who recovered after the black vomit had made its appearance.

None recovered after a violent hiccup came on, or a total suppression of urine.

Children,

Children, adults, and old people labouring under the small-pox were constantly attacked with this fever, about the time that the secondary fever usually comes on, and none recovered, but those who had begun to take bark and wine after the eruptive fever, and continued this remedy and a nourishing diet for some time after. It made no difference whether the small-pox were of the confluent or distinct benign kind.—All fell victims to this disease, who were not treated in the manner mentioned above.—Those who recovered of this fever were never attacked a second time, at least no instance occurred of it in our island, nor in any of the other islands, as far as I have been informed.—Neither were they subject to be attacked with an intermittent, as those who had recovered from the bilious remittent fever of the West Indies in general are; but they had a very long convalescence.

On dissection, a great quantity of the same kind of black viscous fluid was found in the stomach, that had been vomited up

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before

before death.—The gall bladder and the ducts were filled with black bile, of a ropy viscid consistence, and the liver seemed to be enlarged and *soft*, but not otherways apparently diseased; the spleen did not seem to be much affected.—The intestinal canal was filled with a viscid black stuff, of a thicker consistence than that which was found in the stomach, and very much resembled tar, or very thick meconium.

The cadaverous offensive smell of those in a dying state or directly after death, did not appear to me to be so considerable, as it is in those dying of the bilious remittent fever; but the body turned quite black very soon after death.

SECTION IV.

THE French call this fever the *Maladie de Siam*, for the same reason that it is termed the *Bullam fever* in Grenada; and sometimes it is also called *Maladie des Matelots*, on account of sailors being particularly

ticularly liable to it.—The Spaniards call it Vomito-nigro, from the black vomit which never fails to make its appearance towards the close of the disease; but it is of little use to know this distinguishing symptom at so late a period. It appears to be a fever of the typhus kind, and very properly called typhus icterodes in Dr. Cullen's synopsis.—Perhaps the heat (as it is only in very hot weather, or in very hot climates that it appears) occasions that great determination of fluids to the liver, and that extraordinary secretion of vitiated bile, which characterizes this from all other fevers of the typhus kind, and renders it more fatal than any other, the plague not excepted.—I think the term Yellow Fever the best adapted to distinguish it from others, and I have therefore continued it.

I have never seen any publication on this fever since it broke out in the West Indies and America in the year 1793; but I had letters frequently on this subject from my worthy friend Dr. Wright of Edinburgh, now physician to his majesty's

forces in Barbadoes, and I communicated to him from time to time my observations on this disease, and the success of my method of cure. I have been informed that it has been considered, by some authors, as an imported and very infectious disease; but in this island it did not appear to be either imported or infectious. The very few instances which seemed to indicate contagion, I think may be accounted for on other principles.—Some inhabitants who had been accustomed to breathe a cool healthy air in high situations in the country, were sometimes attacked after a visit to town, in the same manner as new-comers from Europe and America, who never had been in the West Indies before; the reason of which will be inquired into hereafter.—Those who had resided long in town, or near the sea-side, were not attacked with it.—The physicians and surgeons who visited the sick, and the nurses who attended them constantly, were not infected, nor did there occur a single instance of one of them being seized with this fever for these three years that I have remained in the island, since it broke out; altho' no prophylactic, or precaution of any
sort

fort whatever, was made use of to counter-act or avoid contagion. I am therefore of opinion, that this terrible disease was not imported into this or any other of these islands, or into America, but that it was produced from natural causes. I do not contend, however, that it did not become contagious in some measure afterwards, in some of the towns, ships, or other places, in proportion to the degree of concentration of the vitiated air in them, both in this climate and in America. But I shall postpone my enquiry into the remote causes of this fever, until I have treated fully on the method of cure, which is by far the most important part of my subject, and ought to be particularly attended to.

SECTION V.

Method of Cure.

THE first indication is to subdue the fever by the most speedy means in our power. The second is to prevent the putrescent state that follows so rapidly after the

febrile stage, or to oppose its progress when begun, and at the same time to support the strength of the patient. From the remarkable flushing of the face, great inflammation of the eyes, and full pulse in the first stage of this disease, young practitioners might be induced to use the lancet freely, and the French surgeons, whose chief remedy in almost all disorders in these islands is venesection, very readily fell into this error. There was not a single instance of an emigrant recovering who had been bled. The English practitioners avoided bleeding their patients, and very few of the French, who put themselves under their care from the beginning of the disease, died of it. Some time after, a few cases occurred that seemed to require bleeding, and it was employed with success; but these were new-comers immediately from Europe, who had never been in the West Indies, of a robust make, and sanguine temperament. A pound, and in some two pounds of blood were taken away early in the disease, with seeming advantage, and some recovered who were treated in this way; but it failed of success in others, and at last it

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was laid aside altogether. It should be observed, that we were seldom called in time to make use of venesection with advantage, even when a proper subject offered. In young athletic people, seized with this fever soon after their arrival in the West Indies, venesection to a certain degree may be of use, if performed during the first twenty-four hours from the attack, but if used after that period, or at most after thirty-six hours, it will always be found prejudicial, if not fatal. It ought to be laid down as a general rule, never to bleed the natives of the West Indies, nor those from Europe, who by residence for a certain time have lost the inflammatory diathesis in their blood, or in other words are seasoned to the climate. Nor should the officers of the navy or army, or their men, when seized with this fever, after having undergone excessive fatigue, and exposure to the violent heat of the sun in a hard campaign, ever be bled. This rule is founded on experience; and the reason is obvious.

Pediluvium

Pediluvium and a purging clyster were generally first ordered, to moderate the violent determination to the head, while more powerful remedies were preparing. Purg- ing was the chief means employed to re- move the fever, but the stomach could sel- dom be brought to retain the common pur- gatives: and even when they were not vo- mited up, a triple dose was always necessary to procure sufficient evacuations by stool. Two drams of jalap were often administer- ed by degrees, and although all retained on the stomach, this large quantity failed to operate sufficiently, and the little effect it produced was not till six or eight hours af- ter it had been taken, whereby much time, which is so very precious in this disease, was lost. From frequent disappointments in this way, I was led to add calomel to the jalap, which was ordered to be made up in the following form:

℞ Pulv. jalapii. ℥ij.
Calomelan. ppⁿ ʒj.
Ol. menthæ guttas iv.
Aquæ fontanæ. q. s. fiat massa
in pilulas xvi dividenda.

Of

Of these pills six or eight were given as speedily as possible, with a cup full of cold mint or cinnamon tea, and two or three more repeated every hour till they operated. If they were thrown up, which sometimes happened, ten grains of calomel were formed into two pills, which were administered immediately, and repeated in four hours, if they had not operated plentifully before that time. The patients were allowed mint, basil, or cinnamon tea, or, in short, whatever weak diluents they relished most, for their common drink, except cold water; but they were always enjoined to drink very little at a time. Crem. tartar whey was very grateful to the sick, and was often used. After the purgative was supposed to have operated sufficiently, if the head-ach was not relieved, a blister was applied to the neck, or over the occiput; and a perspiration was encouraged, by giving warm drinks when the vomiting was not very violent; three or four grains of calomel were given, in a pill, every four or six hours, to which sometimes opium was added, when

when the purging had a tendency to run to excess; in the following form:

℞ Calomelan. ppⁱⁱ ʒi.

Opⁱⁱ puri g^{ss} iv.

Olii cinnamomi guttas iv

Aquæ fontanæ. q. s. fiat in pilulas

N^o vi. capiat unam omni quarta
vel sexta hora.

The use of these pills was continued during the whole of the febrile stage, and often for some days after.—These medicines seldom failed to remove the fever in twenty-four or thirty-six hours, if the vomiting was not so violent, that neither medicines nor drinks could be retained on the stomach, which sometimes happened.—In this case a blister was applied over the epigastric region, which generally checked the vomiting, and had a good effect when employed early in the disease. I found that blistering any other parts of the body than those mentioned above, answered no good purpose; that it served only to torture the patient, and was even frequently hurtful. Blister-

ing was seldom employed, except when the vomiting could not be stopped otherwise, and never used after the febrile stage of the disease. This was the result of experience, for at first we tried them in the second stage, and found they answered no good purpose. When there was very little or no inclination to vomit, I added pulvis antimonialis to the calomel, in the following form :

R Pulver. antimonialis ℥i.

Calomelanos pp^u g^{ss} x.

Syrupi simplicis. q.s. fiat. massa

in pilulas viij dividenda *.

Four of these pills were immediately given, and two more repeated every second or third hour after, till they had some effect. If the first four occasioned a reaching or vomiting, no more were given, and the calomel pills were resorted to. A grain or two of opium was given afterwards, to settle

* Sometimes equal quantities of the antimonial powder and calomel were made up, and divided into the same number of pills; and sometimes James's powder was used in the same way.

the stomach and to procure sleep. If this medicine operated plentifully by stool before the opiate was administered, and a profuse perspiration followed, the fever was carried off in twenty-four hours, and the patient recovered; notwithstanding which, the calomel pills were continued, and the antiseptic plan pursued for several days after. When the calomel alone, or joined to the antimonial, operated very powerfully, chicken broth, and panada, or sago with Madeira wine or old hock, was ordered to support the patient, and sometimes it was found necessary to order an anodyne draught to moderate the operation of these powerful remedies. The antimonial or James's powder, when joined to calomel, rarely occasioned vomiting. Their effects were, commonly, to excite perspiration and procure a few stools. This preparation, however, was not used so often as calomel alone, or with jalap. The vomiting was so much dreaded, that we chose to trust to these rather than run the risk of increasing or exciting this too often fatal symptom, by an antimonial of any kind; yet the antimonial thus
combined

combined had a very good effect upon some, when administered very early in the disease; and in all cases which are looked upon as very desperate, it ought to be tried. The dose of the antimonial, and also of calomel, when used as an evacuant, may appear to be too large, and even dangerous: but to this most desperate of all diseases, it is necessary to oppose, very speedily, the most powerful, and even seemingly desperate remedies *. The effects of them were, however, generally restrained by opium, as before mentioned, when their operation, either upwards or downwards, tended to weaken the patient. None of the French, who were treated in a trifling manner by their own surgeons in this island, ever recovered. Some indeed were hastened to their graves by frequent bleedings and the warm bath. Others were lost for want of active purgatives at the commencement of the disease; their cure having been, in general, trusted

* Hippocratis Aphorism. Sectio i. Aphorism 6.

to clysters, ptisans, and a dose of manna, or crem. tartar.

After the febrile stage, the calomel was continued to be given as an alterative, in doses proportioned to the apparent danger, with or without opium, according to the state of the primæ viæ. From three to four grains of calomel in the form before mentioned, were administered every four or six hours to an adult, and a glass of strong decoction or infusion of red bark with orange peel, was ordered every hour and a half in the intervals, together with as much nourishment and wine as the stomach could bear, but always given in small quantities, and often repeated. In this way we proceeded for thirty-six or forty-eight hours after the febrile stage was over, by which time the fate of the patient in general might be determined; other more simple means were sometimes employed, to oppose the supposed putrid tendency in the fluids, as will be hereafter mentioned. A ptyalism rarely took place, but the gums were sometimes a little affected about the third day, in which case the mercury and every

every other remedy was suspended, and nourishment and wine only given; when this happened we could venture to prognosticate, with confidence, the recovery of our patients. But it was too frequently the case, that we were not called to the sick till the middle stage, when the yellowness had appeared. At this time we had to combat with great languor and debility, attended with great uneasiness at the stomach, and a constant reaching to vomit.

If a purgative had not been administered before, a purging clyster was ordered, and three or four grains of calomel given every five or six hours with or without opium, according to the patient's strength; the above antiseptic plan pursued, and nourishment and wine given frequently. If they had been purged, an opiate with calomel or an anodyne draught was ordered, and the alterative pills, and the decoction of bark, &c. given as to those who had been under our care from the beginning. At first, as has been before observed, we tried a blister over the epigastric region, but finding it an-

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swered

swered no good purpose at this period of the disease, it was not continued afterwards. Epithems of aromatic herbs, spices, mustard, and wine, &c. were applied over the region of the stomach to check the reaching, but to little purpose. Bark in substance never would sit on the stomach. The strong decoction of the red bark, to which the spiritus ætheris vitriolici was added, generally remained on the stomach, and agreed better than the common bark. A small tea-spoonful of this vitriolic æther was given in four table-spoonfuls of this decoction every hour and a half, or two hours. Sometimes this vitriolic æther was given in strong camomile or snake-root tea, when the bark was rejected; and when neither of these would remain upon the stomach, it was given in peppermint-water, or plain water and sugar, or in what is called fangree; and in general it proved very cordial to the sick, and grateful to the palate. Clysters of the decoction of bark with this spirit, or with vinegar or lime-juice, were thrown up every two or three hours; and sometimes the body was rubbed over with
lime-

lime-juice or vinegar. The strained juice of the oxalis, or wood-sorrel, was given inwardly, and used in clysters, with more evident good effects, in restraining the putrid tendency, than any other acid. I knew two patients, who had only taken a few calomel pills, and afterwards by the use of this acid, with wine and nourishment, recovered, after the second stage had made great progress, and even after the black-vomit had appeared in one of them, without any other remedy whatever. Elixir of vitriol was tried, but the mineral acids were not found to sit so easily on the stomach as the vegetable. A glass of peppermint-water, from time to time, relieved the uneasiness at the pit of the stomach, or a few drops of the essence was given on a bit of sugar. When a bleeding from the nose came on, alum-whey was given for common drink, and the hæmorrhage was restrained by a strong solution of white vitriol. Great attention was paid to cleanliness in the houses or ships where the sick lay, and vinegar was sprinkled frequently all over them every day. Branches of

shrubs and leaves of trees were sprinkled with water, and sometimes with vinegar and water, and put in the windows where the rays of the sun came, in order to assist in purifying the air of the rooms by increasing the quantity of vital air. Vinegar was frequently thrown on hot iron in the chambers of the sick, with the same intention. All this time wine was administered gradually, either with water and some grateful acid, or mulled with spices, as the state of the patient required. Pure ether was of little service, the effects of it being so soon over. Camphor seemed to ruffle the stomach, and increase its irritability, and was laid aside after a few trials. Mustk had no effect whatever on the hiccup, and being an expensive remedy, was, after six or eight trials, left off. Opium procured some respite from this symptom. Saline draughts, given in the act of effervescence, checked the vomiting for a time, and were really serviceable, especially in the first stage of the disease. But all these means and simpler remedies were ineffectual to resist the fatal tendency of the disease, and were only considered

sidered by us in the light of collateral aids. Our greatest dependance, or, in the nautical style, our sheet-anchor, was mercury. Antiseptics, tonics, wine, and nourishment, were no doubt also absolutely necessary, and without which, perhaps, this remedy would have failed of success.

I was led to the use of calomel in the first stage, on account of the tardy and ineffectual operation of other purgatives, as before mentioned. At that period, the necessity of purging seemed to be clearly pointed out, from the evidently violent determination of the circulation to the head. In the second stage, the determination appeared to be equally violent to the liver, which was then the principal seat of the disease.

Mercury is known to remove in an extraordinary manner, the principal diseases of the liver, such as the chronic hepatitis, and obstructions from repeated and long continued attacks of intermittents, and to correct a vitiated or superabundant secretion of bile, and also to cure the dysentery, sup-

posed to proceed from thence; all which no other medicine yet discovered, is possessed of such power to effect: And as every indisposition or complaint arising from an over secretion of Bile, so common in the West Indies, is most speedily and effectually removed by calomel, employed as an alterative as well as a purgative, I was induced by analogy to continue the use of mercury with this intention, after the febrile stage was over, and it has fully answered my expectation. In a few cases of this fever, where there was an evident enlargement of the liver, and where the incessant vomiting prevented our throwing in a sufficient quantity of calomel in a short time, I used frictions of strong mercurial ointment over the hypochondria and epigastric region. If the gums were affected by the rubbing, all went on well. But this method of cure was not sufficiently pursued, owing to the trouble that it gave to the nurses. I think it a good practice in all cases where we are much pressed for time, or such as are considered to be very desperate. In hospitals it ought to be attempted, especially

especially on such patients as can scarcely retain medicine or drink on their stomach for a moment, which happens very often, and these are always looked upon as truly desperate cases. After the black-vomit has made its appearance, there is little to be hoped from any remedy. But to shew the powers of mercurial friction, I cannot but add, that in two cases of idiopathic tetanus; I ordered a pound of mercurial ointment to be applied by friction to each, in the course of three days, by which the gums were affected, the spasms abated, and both patients speedily recovered. The dry belly-ach, which is also a violent spasmodic malady, is likewise cured by mercurial frictions, as well as by calomel; for this disease is removed as soon as the mercury affects the mouth, which happens generally before stools are procured; and even when a plentiful alvine evacuation takes place, the symptoms are seldom if ever removed entirely, till the mercury takes effect. In short, I am convinced from long experience, that mercury is fully as useful, and as indispensably necessary for the cure of all

diseases of the bilious and spasmodic kind between the tropics, as the Peruvian bark is in the remittent and intermittent fevers of all warm climates. Without the aid of these two invaluable remedies, perhaps few Europeans who visit hot climates, would live to return to their native land. I tried the sea-water bath on some patients, who could not retain medicine. A large pailful or two of cold salt water was thrown over them four times a day, and after being well dried, they were covered, and had some warm mulled wine or sangree given to them. This seemed to have a good effect for a short time, and it appeared to retard the progress of the disease; but it did not, upon the whole, succeed well in this Island; probably from its having been in general tried when too late; for my friend Dr. Archibald of the island of Nevis, certainly employed this method of cure often with success; and I have heard that it has also succeeded sometimes in Jamaica. It ought to be used after a purging clyster, or after a purgative, but not after mercury has been administered. Our confidence in mercury, prevented

METHOD OF CURE.

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prevented our making more frequent trials of sea-bathing, as the use of both at the same time we conceived to be incompatible.

When called early in the second stage of the disease, we found that by the use of mercury, a steady perseverance in the antiseptic plan, good nursing and care, many of our patients recovered, and some even after the black vomit came on, as was mentioned before, in whom however the other mortal symptoms, such as violent hemorrhage from the nose, hiccup, and suppression of urine, were wanting.

But in the worst cases, or such as had been neglected at the beginning, where the septic process had got such a firm hold of the system, that it proceeded with a gradual but steady step, increasing in violence every hour, till at last a total dissolution of the whole system took place, no remedy that we tried seemed to have any power even to retard, much less to resist its fatal progress.

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From a firm belief that this disease was by no means contagious in our island, the sick were not abandoned by their friends, nor neglected by their attendants, which contributed very much to the recovery of many who would otherwise have been lost for want of care. When the opinions of medical gentlemen, who practise physic in the West Indies or America, lean to the side of this being a very infectious disease, it is of the utmost consequence to conceal them as much as possible from the attendants on the sick, and even to hold out a contrary opinion, for otherwise the sick will be abandoned to their fate; and the dread of infection will operate so powerfully on the minds of the people, that many will be seized with the disease when it becomes more frequent, and the air is farther vitiated; who, if not influenced in this manner, might have escaped an attack. A strong confidence in some, that a disease is not infectious, and a great fortitude of mind in others, who conceive it to be so, or their firm reliance on some favourite plan of prevention,

vention, are perhaps the greatest preservatives * we know against any contagion.

* When I make use of the plural "we," I mean my friend Dr. Fillan of Dominica, who had an equal share of the business with myself, and of course followed the same method of practice.

WHEN the disease was become frequent and raged with violence, many new-comers from Europe were attacked with it in eight or nine days after their arrival; some were seized a fortnight after, of these I know three young men from 15 to 25 years of age, who arrived the same day on the island, and were attacked that day fortnight all about the same hour, one of whom died the fifth day, and the other two recovered; but of these I only attended one, who was cured by mercury. Many were not seized till after a month or six weeks residence; and I remember one instance of a person dying of this disease, after he had been nine months in the West Indies, and had visited other islands. But in general, the attack upon new-comers was during the first month.

CHAPTER II.

SECTION I.

The Method of Prevention.

WHEN the disease was become frequent and raged with violence, many new-comers from Europe were attacked with it in eight or nine days after their arrival; some were seized a fortnight after, of these I knew three young men from 13 to 15 years of age, who arrived the same day on the island, and were attacked that day fortnight all about the same hour, one of whom died the fifth day, and the other two recovered; but of these I only attended one, who was cured by mercury. Many were not seized till after a month or six weeks residence; and I remember one instance of a person dying of this disease, after he had been nine months in the West Indies, and had visited other islands. But, in general, the attack upon new-comers was during the first month

month or six weeks after their arrival. Officers of the navy and army were rarely attacked during the severe fatigues of a campaign, and even when exposed to the violent heat of the sun; but in a few weeks after they were relieved from it, and repose succeeded to excessive exertion and anxiety of mind, very few escaped an attack. Emigrants who had endured much fatigue in their flight, had lived on poor nourishment, had bad lodging and little sleep, and who had been harassed by the influence of fear, grief, and excessive heat, all of which are powerful pre-disposing causes, were attacked almost to a certainty in a week or ten days after. When this fever prevails, I found one bleeding necessary for new comers of a sanguine temperament and a robust make, and a cooling purgative the next day; and ordered them to live chiefly on a vegetable diet and fruits, and to avoid the heat of the sun as much as possible, and to take some cooling laxative medicine frequently during the first month or six weeks. But lately my chief dependance was on mercury. A purge of calomel and jalap was first given,

given, and frequently repeated, or a few grains of calomel were given once or twice a day till the gums were affected, and a purgative afterwards; and soon after, this course was renewed without confining the patient, and after this some bark was generally ordered every day for a week or more. Few could be prevailed upon to continue the mercurial course long enough, and fewer still to renew it, but such as did were not attacked. On the arrival of Europeans, a few calomel purges in the course of the first ten days, with a vegetable diet, and the moderate use of wine, together with bark for several days after, and the renewal of the calomel purges and bark from time to time during the first two or three months residence, was the most common method employed to prevent an attack, and it was generally successful. It is worthy of remarking, however, that a strong dose of calomel was commonly given upon the least indisposition, or appearance of an attack, and bark in infusion or otherwise taken for some days after. The officers of his Majesty's navy and army, who have leisure, and can
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be prevailed upon, on their arrival, to undergo one or two gentle courses of mercurial, taking a few laxative medicines after, confining themselves to the moderate use of wine, and living chiefly on vegetables and fruits for the first two months, may rely almost to a certainty on escaping this fever. But if the nature of the service requires their exertions immediately, which has generally been the case since this fever first broke out, a few brisk calomel purges as soon as possible after their arrival, and bark at intervals during the service that they may be upon, will generally secure them against an attack. But as soon as the service is over, they ought then to be most attentive to prevent an attack, and not to neglect, if possible, taking calomel for several days, and bark afterwards. The same plan ought to be followed in regard to the sailors and troops in these islands, but this must be attended with much difficulty, and I shall not presume to advise the medical gentlemen of the navy and army on this head. Their own experience has no doubt pointed out to them the readiest and safest mode of administering

ministering medicines, and also the best method of treatment; my intention here being only to recommend, in the strongest manner, the liberal use of mercury when an opportunity offers, both as a preservative against, as well as an effectual remedy for this fever; and in the former case, to fortify the constitution by the plentiful exhibition of bark, continued for some time, especially after a hard campaign, or great fatigue and exposure to the excessive heat of the sun. The emigrants could not bear much purging; one dose of calomel and rhubarb was sufficient for them, and bark afterwards, renewing the purgative occasionally. This method secured all against an attack, who were under our care in this island. Some new comers, who escaped this fever by the means above-mentioned, had some months afterwards an attack of the remittent bilious fever, or of an intermittent, neither of which are dangerous diseases when attended to in the beginning, being considered here as only a seasoning to the climate.

CHAPTER III.

SECTION I.

*An Inquiry into the remote Causes of this
Fever, at Dominica, and in the other
Islands, and in North America.*

DURING the hurricane months of the year 1792, there was very little thunder in this island, and the weather was very sultry. From the month of January to the 15th of June 1793, when this fever first broke out, the weather was extremely calm, and much hotter than usual in this, as well as the neighbouring islands. There was little rain till the 15th of October.

2d. We had no thunder in the months of May and June, nor in the autumn of the year 1793, which had not been the case here for twenty years before. This circum-

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stance

stance was also remarked in the other islands.

3d. Fahrenheit's thermometer, in the months of June, July, August, and September of the same year, generally rose to 88 or 90 degrees, and sometimes to 92°, between the hours of two and four o'clock, P. M. when placed in a large room, with all the doors and windows left open to admit fresh air, as is customary in the West-Indies. At ten o'clock at night it seldom fell below 80°, and at daylight in the morning, which is the coldest time of the twenty-four hours, 79° degrees was the lowest. When the thermometer was carried about in the streets of the town, it rose to 110 degrees, and when hung up in the sun, the mercury was soon at 120°.

In former years the thermometer had been frequently observed to rise to 90 and even to 92 degrees, in the autumnal months; but it never continued long at this height; for the cloudy weather, heavy rains, and
a thunder

thunder storms, which never failed to happen at that season, cooled the atmosphere. The heat, for some months before, and during the continuance of this fever in the island, especially in the night-time, was almost insupportable. The variation in the rise or fall of the mercury in the barometer in these islands is so little, that keeping an account of it did not appear to me to be of consequence.

I was informed by a gentleman, who was in North America when this fever broke out at Philadelphia, that there had been no thunder before, and very little during the autumn of 1793, whilst it raged with such violence, and that the weather at that time was excessively hot and close. It has been remarked all over North America, that the weather had been much hotter in the summer and autumn of the two last years, and that there had been very little thunder during all that time, in comparison with former years; neither had there been any of the usual violent gales of wind upon the coast for the three preceding autumns. In the

autumns of 1794 and 1795, this fever prevailed in Charles Town, Norfolk, and New York; it broke out in the latter on the arrival of great numbers from Ireland, and in the two former, on the arrival of crowds of emigrants from St. Domingo and the other islands. According to Dr. Lining's account of this fever in Charles Town, South Carolina, communicated in the *Essays Physical and Literary*, Vol. II. it appears to have broke out there in the years 1732, 1739, 1745, and 1748; he thinks it was always imported from the West Indies, but gives no proof, or even reason, in support of this opinion, which does not seem to be well founded.

5thly. This fever has not prevailed much in these Windward Caribbee Islands for many years past. At Fort Royal, in Martinique, where there is a great prevalence of mephitic effluvia, arising from the marshy ground at the back of the town, it generally broke out in the summer or autumnal season, on the arrival of troops from France, or of a number of seamen, who ne-
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ver had been in the West Indies before; and the same thing happened at Point à Petre, in Grand Terre, Guadaloupe, almost annually, and from the same cause; but it was never looked upon as an infectious disease, nor did it ever spread among the natives of the towns, or among those who were seasoned to the climate, nor was it ever carried from thence to the other islands. In this island but few cases have occurred for these last twenty years, and these have chiefly been at Prince Rupert's Head, where, from the stagnated water in a large morass near the town and fort, the marsh miasma prevails in a high degree. Since the swampy places which were in the town of Roseau have been filled up, this fever has been seldom observed; but previous to the year 1792, we had generally violent thunder storms, heavy rains, or severe gales of wind, during the autumnal season.

M. Disportes, in his *Histoire des Maladies de St. Domingue*, during the fourteen years that he kept a journal of the diseases at Cap François and Fort Dauphin, found that

this fever broke out constantly in these towns upon the arrival of new-comers from France, and among these, only such as had not been formerly in that climate; and at the time it raged, which was chiefly during the autumn, the old seasoned inhabitants were only attacked with bilious remittents, and, what he terms, the lymphatic fever, which seems to have been more of the typhus kind, than of the bilious, but very different from the yellow fever. Dysentery also prevailed among the seasoned inhabitants at the same time. In and about these towns, during these fourteen years, viz. from the year 1732 to 1746, there were a great many inlets of the sea, where the water continued long in a stagnated state, which in so hot a place produced very offensive exhalations; to these he attributes this fever, and the bilious and other diseases that prevailed at the same time. He mentions little in regard to the general state of the weather, or even as to gales of wind, or thunder and rain, and having no thermometer, he could give no accurate account of the degrees of heat.

6thly.

6thly. I have observed, for many years past in this island, that when we had much thunder and very heavy rains in the months of June and July, we always escaped a hurricane, or a severe gale of wind. On the contrary, if we had fine weather in these months, we had either a hurricane, or a very sickly season after. If that severe scourge of the inhabitants of the West Indies took place, by which the whole country was laid waste, and desolation was every where to be seen, the inhabitants had better health, than is usual at that time of the year, to compensate them for their great losses and calamities. This was observed in all the islands that suffered by the severe hurricane of 1780. It was verified here; although we had only, what is called, the tail of it. And in the year 1787, after two very violent hurricanes in one week in this island, the inhabitants were extremely healthy; but it was health dearly purchased.

7th. In the months of June, July, and August 1794, we had some slight thunder storms, and this town was not so un-

healthy afterwards; although many had this fever, and some died of it. In the same months in 1795, the thunder was more severe; we had bilious complaints and intermittent fevers all over the island, but this fever almost disappeared; and only a few cases occurred afterwards. I have had no information in regard to the state of the weather either in Jamaica or St. Domingo, during the three last years, that this fever has proved so destructive to our countrymen there.

By the excessive and long continued heat of the sun, the state of the atmosphere appears to be so much vitiated in all warm climates, that if some agent or means were not employed from time to time by nature to rectify it, these countries would become unfit for the residence of human beings.

Thunder, heavy rains, and violent gales of wind seem to be the agents for this purpose; which are the causes of restoring that due mixture of parts to the atmosphere, so indispensably necessary for the support of health.

A strong

A strong gale of wind, which is the most powerful instrument made use of for effecting this purpose in all climates, and which, from its periodical or frequent returns in the warm season, is called in the East Indies and about the coast of Africa, tornado; in the Mediterranean sea, levanter; on the coast of North America, north-wester; and in the Windward and Leeward West India Islands, hurricane. These winds produce but too often the most dreadful effects both by sea and land, but they seem to be directed by Providence for the good of the whole, at the expence of the few. The other agents answer likewise the purpose of purifying the air, although in a much less degree. The want of these correctives, as they may be termed, for impure air, left it in a state truly obnoxious to general health, which I think was, most probably, the remote cause of this fever,

It was remarked, after the arrival of such multitudes of people at Roseau, at the time when this fever had begun to rage with violence,

lence, that the air had a flat kind of smell, And that people soon became faintish in it, on using even very moderate exercise. This induced me to make trial of the air, by Mr. Scheele's simple apparatus, not having a proper eudiometer. The purity of the air is perhaps ascertained more accurately in this way, than it can be by the nitrous gas; which depends so much upon a variety of circumstances in the separation of it from the acid of nitre. I filled, at different times, gallipots with liver of sulphur, and also with iron filings and flower of sulphur well mixed and moistened, and put these upon a stand under a glass vessel, which was placed on a stool in a pail of water. The glass vessel was marked and divided on the outside, and allowance being made for the space that the gallipot occupied, the water rose only one-fifth in the glass vessel, after standing twenty-four hours. When the disease abated, it rose near one-fourth; and upon many trials afterwards, when the place became more healthy, the water never rose above one-fourth, which makes about twenty-

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five parts of vital air that was taken up, but perhaps it was not entirely absorbed.

The air in the mountains of this island is very pure, and remarkably salubrious. I ascertained the heights very accurately of the places in the vicinity of the town, where the inhabitants were never attacked with any fever, but of the catarrhal or inflammatory kind, and where the people live to a great age; and to which, when the emigrants had fled, they always avoided an attack of fever, or soon recovered if in a convalescent state: The elevations are as follow:

Feet high above the level of the sea.

Nº 1. Bruce's Hill	360	Pleasant and healthy, but not so much so as Daxon's Hill.
2. The outer Cabrit, at Prince Rupert's Head, is	600	More healthy than the inner Cabrit, and pleasant.
3. Daxon's Hill	1010	Very healthy.
4. One Tree Hill, and the environs about the same height	1300	Remarkably healthy.
5. Mount Pleasant Es	1360	Ditto.
6. Petit's House, called Teneriff	2050	Cold and rather damp, and not so healthy as the other places.

The places at-
tended to above

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Although situations only from 400 to 600 feet above the level of the sea are healthy and pleasant, yet it appears from the foregoing experiments, that the air is purer and more healthy from the height of 1400 to 1500 feet, than it is when much below or above that height; in the latter case it becomes damp and raw, and by experience I find the inhabitants are not so healthy in such high situations. I could not ascertain the proportion of vital air in the atmosphere at these heights, for want of a proper eudiometer; Mr. Scheele's apparatus having been found quite inconvenient for that purpose; but this I will endeavour to have tried exactly, on some future occasion. If the troops on their arrival in the West Indies could be quartered in such high situations for a little time, till they got accustomed to the heat of the climate by degrees, so many of them would not be lost. Where this is impracticable, they should if possible be landed in these islands in the month of December or January, which are the coolest times of the year.

Theory.

Theory. This derangement of the component parts of the atmosphere, was probably effected by the strong light and intense heat of the sun having disengaged, or formed some combination with its vital part, or a certain portion of it, which being so united and rarified, would rise far above that stratum of air, in which we, in lower situations, breathe, leaving the mephitic or heavier part near to the surface of the earth. The loss of a small portion of vital gases would render this lower stratum very unfit for respiration, and of course very unwholesome to live in. The atmosphere of this town became probably vitiated in this manner by degrees, and therefore did not affect the health of the inhabitants either suddenly, or very considerably. The common remittent fever, dysentery, and other bilious complaints, had, however, begun to show themselves, previous to the appearance of the yellow fever.

* M. de Fourcroy's Preliminary Discourse, in his Elements of Natural History and Chemistry.

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The air already thus changed, was, by the sudden arrival of a number of persons greatly exhausted, and unprovided with changes of clothing, and also crowded together in an extraordinary manner, so contaminated with mephitic exhalations, and exalted to such a pitch of malignancy, that all who had been accustomed to breathe a purer air, viz. the Europeans, Americans, those from high situations in the mountains, as well as the emigrants, who, as mentioned before, were predisposed by a multiplicity of causes, would be readily and greatly affected by it. If the constitution is able to resist the first attacks of the common bilious remittent fever, occasioned by residing in the neighbourhood of such places, experience has shown us that by habit the baneful influence of these mephitic vapours will be entirely overcome, and that such persons having escaped some attacks of this kind, may continue to live in such an atmosphere, and enjoy as good health, as people in general do, in West India towns. But the animal economy is not only influenced by habit in all its parts, but it has also a power of conformity

formity to almost any change, either of increase or decrease of nourishment, or of labour, as well as of rest, confinement, want of sleep, &c. &c. as it has also of breathing a foul unwholesome air with little apparent injury to health, provided any, or all of these variations or states of life, are brought about gradually. The direction of our ideas, and the powers of thinking and feeling, are in all cases influenced by custom. For these reasons, probably, new-comers are speedily attacked with this fever after their arrival, even in places where it does not prevail, and this gives it so much the appearance of an infectious disease, where it has already broke out.

A deranged state of the atmosphere, as mentioned before, seemed to me to be the first cause that excited this mortal disease in our island, and as it prevailed in the different towns of the other islands, the more they were crowded with strangers, I am inclined to believe, that it proceeded from the same cause in them all, aided, and perhaps put in action, by the great concourse of people

people in towns exposed to so much heat. New-comers from Europe, in high health, were soonest affected by this impure air; others, who had resided some time in the wholesome places in America, and in the French islands, resisted its baleful influence much longer; and perhaps, by the extraordinary or immoderate accumulation of it, in some West India and American towns, even the old inhabitants were sometimes affected with this fever. In this way, many fevers of the typhus kind may become more or less epidemic, which are not in themselves contagious, as is always the case in the jail and ship fevers. I believe the air did never arrive at that contagious degree of accumulated impurity in this island: For when patients labouring under this fever, were removed to high situations for the sake of breathing a cooler and purer air, and who, notwithstanding, fell victims to it, the people about them were never infected, nor did the disease ever prevail afterwards in such places. — And I have been assured that this was exactly the case in America. There appears to have been such an exten-

five and very peculiar deranged state of the atmosphere in the towns in these islands, and in North America, that it is more probable, this disease was produced by this general cause, breaking out nearly at the same time in different places, than that it originated only in one or two towns, and was carried from thence by infection to others, by either persons or goods, as has been supposed. The regular return, and continuance, of this fever in the months of July, August, and September, every year, more or less, since its first appearance in these islands, and in the towns in America, seems to me to argue strongly in favour of this opinion. From these facts and observations I am of opinion, that in all hot climates, where a great depravity of the atmosphere is produced by the causes already mentioned, and where its natural purifiers are wanting, this fever will break out in such places, on the arrival of a great number of strangers, more especially if they come from a cold country. If such impure air is allowed to be the remote cause of this fever, as appears from what has been said; the air in respiration, in

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this

this case, not having a sufficient quantity of oxygene, may occasion a deranged state of the fluids, which I conceive to be the immediate stimulus or excitement, or what may be termed the proximate cause of this fever. And if the biliary secretion be intended for the discharge of the degenerated lymph and crassamentum of the blood, as Dr. Maclurg thinks, in his dissertation on the bile; the great redundancy and degeneracy of the bile in this fever may be easily accounted for on that principle. This derangement may be the cause of an increased determination of the fluids to the liver, and as the morbid animal process gains ground, which it does every hour, if not opposed by powerful remedies, the liver becomes more and more distended with blood, and the biliary secretion is increased and hurried on in such a rapid manner through the extremities of the pori biliari, that it resembles grounds of coffee rather than bile, which, upon a narrow inspection with a magnifying glass, seemed to be black dissolved blood, floating in lymph or mucus. When the blood, dissolved by this morbid process,

process, meets with any obstruction, it gushes from the nose and mouth in almost a colourless state, and in such prodigious quantities, that the patient soon sinks into a state of total dissolution.

Query. Is it possible to discover a method to purify the atmosphere of a town, or to deprive it of the superabundant quantity of mephitic gas, so destructive to animal life?

Fire has been formerly employed as a purifier of the air, wherever great malignancy of it was suspected; but since the discoveries of the late Monsi Lavoisier and others, shewing that combustion deprives it of a portion of the vital part so essential to life, some doubts may be entertained in regard to the propriety of using great fires on such occasions. But it may still be a question, whether the good effects of fire, especially in ships and close chambers, may not be accounted for from the rarefaction and consequent influx of fresh air which it occasions?

Burning of brimstone and other combustible substances in the holds of ships, and also in prisons and hospitals where bad air prevailed, has been found useful in purifying it. Might not a large fire of wood placed twice a day at the leeward side of hospitals, where the sick of this fever are, be of some service in purifying the air? Leaves of vegetables wetted and placed in the sun's rays in the windows and doors on the windward side of hospitals or houses where the sick are placed, in the West Indies, as mentioned before, may contribute in a small degree also to purify the air. Perhaps the explosion of gunpowder in some convenient parts of the towns in the West Indies and America where this fever prevails, two or three times a day, would be useful in a general way; or, what is better, the deflagration of nitre, or small quantities of moist gunpowder, might be useful to purify hospitals in the inside, or to the leeward of them, in houses and in private practice. This might be tried at a small expence in the West India islands, where cannon powder is so soon damaged in the different gar-
sons

rifons by the excessive humidity of the air, at some seasons of the year.

But all artificial means yet discovered can avail but little, and even the frequent thunder storms that we have had for these two years past, which, although of infinite use in moderating the disease, seem to be too weak agents to restore the atmosphere to its wonted salubrity. A hurricane, that terrible scourge of the West India planter, appears to be the only agent now sufficiently powerful to effect that purpose. And a violent gale of wind (called north wester), together with severe thunder storms, on the southern part of North America, are equally necessary to dissipate the impure air in their towns, and thereby remove from them, for a term of years, this dreadful disease.

OF THE
 BILIOUS REMITTENT
 F E V E R
 OF THE *WEST INDIES*.

C H A P T E R I.

SECTION I.

THIS Fever is the same in all the West India islands, and probably in all hot climates, differing only in the degree of violence, according to the greater or less prevalence of its remote cause, which I conceive to be marsh effluvia.

The Symptoms.

It begins with a chilliness, giddiness, and head-ach; sense of great weakness, sickness at the stomach, and pain of the back. There is a peculiar uneasy sensation all over the
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the surface of the body; the eyes look heavy, the countenance is pale and dejected, the skin dry, and the pulse feeble and very quick. Great anxiety and restlessness soon follow; and when the sense of cold wears off, a violent vomiting of yellow or green bile comes on. The contents of the stomach are generally thrown up during the chilly fit, together with what the patient has drank, for the thirst is then very great. The heat of the body is now increased; the pulse becomes fuller, the face flushed, and a redness of the skin appears, particularly about the breast. The tongue is dry and white, and in grown people the pulse is generally from 90 to 100 strokes in a minute. The patient becomes extremely restless, the vomiting is incessant, and sometimes a delirium comes on. In this state the sick remain from 8 to 12 hours, about which time a slight moisture appears, first on the face and breast, and afterwards by degrees all over the body. When the sweat was general, and continued for an hour or two, and the vomiting ceased, a remission of fever followed. But more frequently the

sweating was partial, and did not continue long; the pungent heat on the skin remained, the vomiting was renewed, and the paroxysm prolonged for 8 or 12 hours more. The urine is always high coloured from the very first symptom of the disease, and continues so throughout. The first paroxysm generally begins in the evening, or about eleven o'clock A. M. The patient is languid and confused after the first fit, his skin soon becomes dry, the heat continues to be greater than natural, he is not quite free from head-ach, and on sitting up or walking about, he feels a dizziness in it. This remission generally continued for 8 or 12 hours, when another paroxysm came on, sometimes with a sense of coldness, but more frequently with a great sense of heat all over the body; the head-ach increased, and the vomiting soon became more violent than it was in the first fit. All the symptoms were now much more violent, and the paroxysm generally continued 18 or 24 hours, when a sweat came on; which, if profuse, a remission followed. When the patient had not taken any medicine, this remission

mission was of short duration, seldom continuing more than 4 or 6 hours. In the third fit there was seldom any rigor, the exacerbation came on with violent vomiting, increased head-ach and heat, and all the febrile symptoms were much higher; the tongue became very dry and foul, the thirst intolerable, and the eyes more inflamed, which symptom, however, disappeared during the remission. The delirium and anxiety were increased, and the ensuing remission was very imperfect, running into a fourth exacerbation or paroxysm in a few hours, which often proved fatal on the fifth day, if no medicine or bark had been given from the beginning, or if the patient had been treated improperly, by bleeding, warm baths, or large doses of emetic tartar. The patient in this case either became quite delirious, or fell into a comatose state. At the height of this paroxysm the heat is greatly increased, and so pungent, that a disagreeable sensation remains upon the ends of the fingers after feeling the patient's pulse and skin. The pulse now beats 120 times in a minute; and towards the close of the

the scene, I have counted it at 130 or 140. The breathing is now very laborious; and there is generally a *subfultus tendinum*, trembling of the hands, feeling the bed cloaths, catching at something in the air, staring, talking and muttering, till the patient is snatched off suddenly by a sort of convulsion; or they sometimes remained in an insensible state for many hours, breathing with great difficulty till they expired. Coldness of the extremities, and cold sweats, are always symptoms of great danger, and seldom fail to appear in the last stage of this disease. I have never observed *petechiæ*; but some hours before death the sick had a cadaverous smell, the face and extremities put on a livid appearance, and the stools were very offensive. I have never met with any patients in this fever who had a bleeding at the nose, and though hiccup is very common, yet it is not always a mortal symptom, as it is in the yellow fever. Musquito bites, and prickly heat, generally disappear on the first attack. A suppression of urine does not come on, nor is it ever of a yellow colour, as in the yellow fever, except in such as have the jaundice.

jaundice as a concomitant symptom. On the contrary, it is remarkably high coloured, resembling porter, both during the remissions and in the paroxysms. When the fever came on without any rigor or chilly fit, the greater was the danger; the remissions being more imperfect. The contrary of which happened in the yellow-fever. When there was much rain in the months of May and June, and dry sultry weather prevailed in the following months of July and August, this fever raged much among the troops and strangers, and sometimes proved fatal when not attended to at the beginning, or when improperly treated. In general, however, it was not so very violent or rapid in its progress as described above; it resembled a double tertian intermittent, with this difference, that the paroxysms were much longer and more violent, and the intermissions were never so perfect, or so clearly marked. When the remissions and paroxysms succeeded one another so rapidly that there was little time to administer the bark, a dose or two of James's or the antimonial powder, and a blister between the shoulders, generally

generally brought about an intermission or a good remission, and then the bark was administered as quickly as possible, and generally with success. In young children this fever sometimes came on with a convulsion fit, or they had one when the hot fit was at its height; which being frequently supposed to proceed from worms, and being treated for such, precious time was lost, and the disease thereby often proved fatal. A fever proceeding from worms in the West Indies I never found to be very violent, nor ever preceded by a cold fit, nor were there any remissions or exacerbations. This ought to be strictly attended to; as many children have been lost from this mistake. The voiding of worms is no certain indication that the disease proceeds from them, although it is a very difficult matter to persuade the parents or nurses that it does not. The more violent and distinct the paroxysms, the greater certainty there is that it is really of the remittent kind. Some grown people had a sense of torpor, or numbness in their extremities upon the first attack of this fever, and others had a temporary privation of sight, which occasioned
great

great alarm; but these symptoms were not followed by fatal consequences, probably owing to the great care, and extraordinary attention that was paid to those who were attacked in this seemingly dangerous way.

I have seen many instances of a yellowness of the eyes coming on, and spreading all over the body about the fifth day, which was at first a very alarming symptom; but by experience it was found not to be a dangerous one. It ought to be observed, however, that in these cases, the paroxysms and remissions of fever were clearly and distinctly marked; and also, that in those who died of it, the black-vomit never appeared, as it did constantly and uniformly in all cases of the yellow-fever which proved fatal. The yellowness coming on in a fever, with evident remissions and paroxysms, may be therefore looked upon as only an accidental jaundice, and unconnected with it in any other way, which is far from being the case in the yellow-fever.

Although

Although some medical gentlemen have supposed the yellow-fever to be contagious, as I observed in my history of it, few, if any, I believe, will contend for this fever being so. In these islands, no practitioner of my acquaintance entertains any such opinion; and I am fully convinced, from long experience, that it is not infectious. The constant supply of fresh air by the trade-winds, and sea and land breezes, probably render diseases very seldom contagious in this climate. The effluvia from rich low lands after much rain, have nearly the same effects upon the human constitution in producing this fever, as the marsh miasmata, or the vapours from stagnated water about the mouths of rivers, or inlets of the sea have, only differing in degree. These bring on intermittents more or less violent, while the strong marsh effluvia produce this fever. Strangers are more liable to the deleterious influence of these mephitic vapours than the natives are, or those who have been seasoned to such climates, as was observed of the yellow-fever; but there seems something different in the
general

general state of the atmosphere, as mentioned before, which renders it less dangerous. While this fever attacked strangers in July and the autumnal months, the natives and seasoned inhabitants were sometimes attacked with intermittents.

The uniform and regular disposition to remit, easily and readily distinguishes this from the yellow-fever. Neither the redness of the eyes, nor the flushing of the face, are so remarkable, and they always disappear during the remissions. The respiration is laborious during the paroxysm, and the pulse always quick and hard, which is never the case in the yellow-fever. A constant vomiting of bile accompanies every paroxysm of this fever from the very first attack, which does not happen so early in the other. This is an invariable symptom throughout the disease. And farther, a remission or evident abatement of the febrile symptoms, takes place always in the course of twelve hours after the first attack, and the paroxysm is renewed some hours after, which is never the case in the yellow-fever,

fever, as I have shewn in the first part of this work.

SECTION II.

Of the Cure of the Remittent Fever.

As there is generally a want of appetite, always a sickness of the stomach, head-ach, an uneasy feeling all over the body, or some indisposition for a day or two before the first attack; five or six grains of calomel at this period, and a brisk purgative given eight hours after, will often entirely prevent the fever; or abate its violence considerably if it comes on, so that the constitution will not be injured by it; especially if six or eight doses of bark are taken daily for three or four days after the purgative. When called during the first paroxysm, if the retching and vomiting were violent, a few cupsful of camomile tea were given to cleanse the stomach; and soon after, a purging draught, consisting of from one to
two

two scruples of jalap in cinnamon or mint water. If this did not remain long enough on the stomach to have the desired effect, a clyster was ordered, and ten grains of calomel and half a dram of jalap made up into ten pills, four of which were given at first, and two every half hour afterwards till they operated. These were seldom vomited up, and were found to be the most efficacious purge of any that was tried. The neutral salts were so often vomited up, that I have laid them aside altogether for some years past, and used the draught or pills, which has answered the purpose much better. Six or eight stools procured by these means relieved the head-ach and vomiting, a sweat generally followed, and with it a remission of all the febrile symptoms. The use of the Peruvian bark was begun as early as possible, in substance, if the stomach would bear it, or in small doses of the powder in two ounces of a strong decoction or infusion of it every hour or hour and a half during the remission. It was sometimes necessary to give an anodyne draught after the purgative, to quiet the stomach previ-

ous to giving the bark. At other times a cup of sago or panada with wine, answered the purpose of settling the stomach. The pale bark in substance was preferred to the red, although the latter made the strongest decoction or infusion, which was given when the powder would not sit on the stomach. If an ounce of bark in substance, or half that quantity in a pint of the strong decoction or infusion, was retained on the stomach during the first remission, the second paroxysm would not be very severe, and the same quantity given in the second remission, would generally prevent a third fit. Purgatives ought constantly to be employed during or towards the decline of the paroxysm, in order not to lose time in giving the bark, when the remission takes place. It is however worthy of observation, that it requires a very large dose of any purgative to have a proper effect during the hot fit of the fever; and on that account the purgatives were generally postponed till the violence of the paroxysm was over. When the patient was not visited till the first remission, and no medicine had been
I given,

given, a purging clyster was ordered; and a dose of bark made purgative by the addition of ten or fifteen grains of jalap was given immediately, and the bark in substance or otherwise, was administered as often as the stomach could bear it afterwards. If not called to the sick till the second paroxysm, a purgative was ordered; or if he had been purged during the remission, which generally happened, five * grains of James's powder or eight grains of the pulv. antimonialis were given to an adult, and repeated every two or three hours, till some sensible effect was produced by it. A grain or grain and a half of pure opium was frequently given to settle the stomach after the antimonial, and to prepare it to retain the bark, which was always exhibited as soon as possible.

When the head-ach was very violent in this paroxysm, and more especially if the patient

* I am inclined to think from repeated trials, that one-third part more is required of the p. antimonialis Londinensis, than of the James's powder, to produce the same effect on the same person.

was delirious, a large blister was applied to the neck, which seldom failed to remove both. If the vomiting became more severe about the end of this, or the beginning of the third paroxysm, and could not be restrained by saline draughts in the act of effervescence, or by a grain or two of solid opium, a blister was applied over the epigastric region, which seldom failed to put a stop to it in a few hours. Mustard was applied over the pit of the stomach, when blistering on that part was not thought safe or proper, and it often had a very good effect. The bark was mixed up in different vehicles, according to the taste or whim of the sick, as in wine, wine and water, porter, toast and water, &c.; but in general cold coffee with a little sugar, covered the taste of it better than any other liquid, and made it sit more easily on the stomach. The taste of it is also very well covered by milk, and in this way it was commonly given to delicate people and to children. When the bark purged, five drops of laudanum were added to each dose, or fifteen drops to the first dose, which never failed to

to prevent its running off that way. If on the contrary it occasioned costiveness, some calcined magnesia was rubbed with the bark, or five grains of jalap added to a dose or two every day, which kept the bowels sufficiently open. The same quantity of jalap seemed to purge more when joined to the bark, than when given alone. The infusion of bark was made with boiling water, when wanted quickly, and at other times it was made in cold water, in lime water, or with magnesia in water.

When the stomach rejected the bark in every form, which sometimes happened, it was given in clysters, either in a strong decoction cold, with some of the powder, or the powder mixed up in thin starch jelly. In the former case two drams of the powder with the decoction, and in the latter half an ounce of the powder, were thrown up every two hours, thirty or forty drops of laudanum having been previously added to the first clyster, to prevent their being speedily discharged. By this method many were saved, who would have died, if no

attempt had been made to employ the bark, when the stomach had constantly rejected it after repeated trials. The bark was applied externally all over the abdomen of children as well as given in clysters, when they could not keep it on their stomachs; and they generally passed a number of worms by the purgative of jalap and calomel given previous to the bark. When no bark had been given during the third remission, the succeeding paroxysm was very violent, and a delirium or coma ensued, in which case a blister was applied to the head, and sinapisms to the feet and hands. The great debility at this period very often prevented our attempting to use the James's or antimonial powder, although it was sometimes administered with success in cases that were looked upon as desperate. But in general, as much bark, wine, and nourishment at intervals, was given as the stomach would bear. A hiccup was a common symptom at this period, and it was always very distressing to the patient, and in some instances continued to the last moment of his existence. It was often relieved by
laudanum,

laudanum, and sometimes by musk. Camphor was always hurtful by irritating the stomach, and increasing that dreadful symptom an incessant vomiting.

After the patient had been purged, and dangerous or alarming symptoms appeared, the bark was given at all times when the stomach would bear it, and it was applied in every way, without any regard to remissions or exacerbations of fever. Nourishment and wine was given between each dose of bark, or as often as possible, and fresh air admitted into the chambers of the sick by every means. When a paroxysm was attended with only a slight delirium, but with great restlessness and anxiety, thirty or forty drops of laudanum gave great relief, and often brought about a sweat and remission of fever.

I have never bled any person in this fever, and although I have heard of venesection being employed with success on some young robust men, when attacked soon after their arrival from Europe, yet I am of opinion that

it is so hazardous an operation that it ought hardly ever to be attempted. I have been confirmed in this opinion from having seen those to whom I have been called, after they had been bled, almost always in such a state of debility, that no cordials or any means whatever were sufficiently powerful to prevent their sinking entirely in the succeeding paroxysm. Emetic tartar increases the irritability of the stomach, and ought never to be used in any stage of this disease. I have known many fall victims to the imprudent, or rash application as it will perhaps be called, of this medicine; but as we have safer remedies at hand, it is better to lay aside the use of it entirely in this fever. When the stomach is foul, and the bile that is thrown up is very thick and ropy, I have ordered an infusion of ipecacuanha with a view to cleanse it, which this simple medicine always effected without increasing its irritability.

In general, very few died of this fever, who were treated in the manner here recommended; and I think I can aver with truth, that I have not lost more than one patient

patient out of fifty, when I have been called to their assistance during the first or second paroxysm, and even very few after the third. Much, however, depends on the early and liberal administration of the bark. Though I have never been able to observe any thing like critical days in this fever, yet I have never known any person die of it after the eighth day.

If the bark was not continued daily for a week or ten days after the fever was stopt, an intermittent of the double tertian or quartan type came on, which was very difficult to be removed, rendered the patient very weak and his convalescence very long. It is absolutely necessary to enforce the use of the bark for some time after, and to keep the bowels open until the strength is thoroughly restored. Camomile or snake-root tea, to which sometimes elixir of vitriol was added, every morning early, and at eleven o'clock, contributed much to restore the appetite. Riding on horseback every morning early, and removing to a high situation in the country when it could be done conveniently, was always recommended.

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If, as before mentioned, the indisposition previous to an attack of this fever be attended to, and five or six grains of James's powder, or six or eight grains of calomel to a robust person be given before the fever is formed, and a purgative next day, an attack may generally be prevented. Or if the skin is very dry, and there is already some fever, a good dose of the antimonial or James's powder will answer the purpose better, and by purging and sweating, prepare the patient for the use of the bark, which ought never to be omitted.

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CHAPTER II.

SECTION I.

Of Intermittent Fevers.

I HAVE not met with a regular quotidian fever in this island; the fit generally came on in the morning of one day, and in the afternoon of the succeeding, and when particular attention was paid to the symptoms, the first paroxysm was found to be more violent than the second, and the fever seemed to partake much of the double tertian type.

In the most regular tertian type of this fever, there is generally some anxiety and uneasiness, or a slight febrile attack, about eleven o'clock in the forenoon, or in the evening of the day of the intermission, which is not often attended to, but constitutes also in some degree a double tertian type. In what is called the tertian ague, anticipations
of

of the paroxysms are very common, which if not prevented by bark will run into one another, and form a real double tertian of a more or less dangerous tendency, according to the duration of the intermissions. From what I have observed of intermittents in this and some of the other West India islands, I am inclined to think that the double tertian and the quartan types are the only real distinctions amongst them. From my own experience I am also of opinion, that the remittent fever follows the same periods in regard to remissions, and paroxysms or exacerbations, as the double tertian intermittent does, differing only from it in degree of violence.

The quartan type, in general, is very distinctly marked, its paroxysms returning very nearly every seventy-two hours. The cold fit of an ague does not continue so long here as it generally does in cold climates, seldom exceeding half an hour; but the longer it continues, the more complete and durable the succeeding intermission always

ways is, and the less danger is to be apprehended.

Intermittents, when neglected or treated improperly, bring on fixed affections of the liver, such as sensible hardness and enlargement, and in some cases the spleen is also enlarged and hard. These obstructions are generally followed by dropsy, particularly after the quartan.

Although purging is not a necessary preparative to the use of the bark, a dose of jalap was generally given; or if the patient had vomited much bile during the former fit, a calomel pill was ordered, and a purge of jalap next morning. But in urgent cases, where the intermissions were short, a scruple of jalap was ordered with the first dose of bark, and the bark was given every hour or hour and a half in dram doses, during the intermission. When the tongue was very foul, and a quantity of thick bile had been thrown up in the former paroxysm, half a dram of ipecacuanha in powder, or an infusion of two drams of the root in a tea-cup full of boiling

boiling water, was ordered to be given on the appearance of the first symptoms of the cold fit, which not only cleansed the stomach, but also shortened the paroxysm, and in some instances entirely removed the disease. A grain and a half or two grains of tartar emetic given to robust people, on the first approach of the cold fit, produced frequently the same good effect. When the type of the ague was ascertained, I did not begin the bark till eight or ten hours before the severe fit of a double tertian, or twelve hours before the fit of a quartan, giving a dram in substance every hour or hour and a half till the time the fit was expected, and generally some doses afterwards, as the bark frequently retarded the paroxysm and made it less violent, when it had not sufficient powers to prevent it entirely. Thirty or forty drops of laudanum given to a grown person in the hot fit, had a good effect in bringing on a sweat speedily, shortening the fit, and settling the stomach, so as to enable it to retain the bark better the next intermission. The pale bark has been preferred of late to the red, the latter having been
found

found often to ruffle the stomach and occasion great uneasiness in it. I have found by experience, that an ounce of bark given in the course of the eight or ten hours preceeding the paroxysm of an intermittent, had more effect in stopping it, than double that quantity had when taken at a considerable distance of time before the cold fit. From this fact well established, I have been able to cure intermittents with one half the quantity of bark or less, than has been usually employed for that purpose. Three or four doses taken on the fever days only, a few hours previous to the time the fit was expected, was sufficient in general to prevent it; but to secure the patient against a relapse, the bark ought to be continued in this way for at least ten days or a fortnight after the fit has been stopped. If no more bark is taken than what is barely sufficient to stop a paroxysm, which, from the aversion people in general have to this remedy, is too often the case, a relapse or return of fever will take place the eighth day in the double tertian, or what is commonly termed the quotidian ague; and in the imperfect double

double tertian, or tertian type, as it is called, the relapse will happen on the fourteenth or fifteenth day, and in the quartan on the twenty-first or twenty-second, making in each type, nearly seven periodical revolutions of the disease from the time the fit was stopped to the next attack. I have observed, when relapses happened at this time, that on reckoning backwards the days and periods of the fever, it was found that the fit returned on the same day, and nearly at the same hour, that it would, if its course had not been interrupted from the commencement by the bark. These relapses will often happen independently of any irregularity of regimen, to which they are commonly imputed. I am inclined to ascribe these periodical returns of intermittents, more to a certain habit contracted in the constitution, than to any influence of the moon over the body, as has been conceived by some physicians. But as great alterations in the weather generally take place about the changes of the moon in this climate, especially in the autumn; and as convalescents are more readily affected by such vicissitudes, I commonly ordered two
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or three ounces of bark to be taken by those recovering from an attack of fever, two or three days before every full and new moon, for some months, which effectually prevented relapses of this kind. It is necessary to observe here, that when intermittents have been neglected or improperly treated in the beginning, and are become fixed in the habit, as it is generally termed, the bark will not succeed without the previous use of mercury, as in such cases obstructions of the liver are brought on, especially in the quartan type, as before observed, which can only be removed by a gentle course of mercury. I have known many instances of quartans having been perfectly cured in this way. When anasarca comes on after repeated attacks of a quartan, obstructions of the liver are to be suspected; and if a hardness of the liver or spleen is discovered on examination, mercury should be administered without loss of time, otherwise a confirmed dropsy will soon follow, and the disease will prove fatal. If the anasarca proceeds from debility, or continues after the obstructions are removed, a change of climate becomes necessary;

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sometimes

sometimes removing to the cool air of the mountains in this island, has answered the purpose of restoring the patient to health; but if circumstances will admit of a voyage to a colder climate, the restoration of health will be more certain, and the opportunity of obtaining it ought not to be lost.

The bark of the *cinchona caribæa*, or *cinchona brachycarpa*, called country jesuits bark, both lately discovered in this island, is also effectual in intermittent fevers. I have cured obstinate quartans with bark of the *cinchona brachycarpa* * in powder, and the tertian ague with the cold infusion of both of these barks; but when the *brachycarpa* is given to white people, it is necessary to throw away the first infusion, as it is extremely bitter, and seems to possess something of an emetic quality. The second infusion is not so strong, but cures common intermittents in a few days. Upon estates among the negroes, the first infusion answers the pur-

* Some experiments have been made on this bark, by Mr. Brand, apothecary to the Queen, which will probably be published.

pose of a preparative to the use of the bark, as it commonly vomits and purges gently, and a quart of the second infusion given every day for two or three days after cures the fever. The cold second infusion is a good stomachic, and may prove a very useful remedy for dyspepsia. I prefer the bark of the *cinchona brachycarpa*, but it as well as the *caribæa* seems to be somewhat deficient in the astringent quality possessed by the *cinchona officinalis*; I therefore sometimes added a little of the bark of the * *prunus spharospermus*, called bois tanne by the French, being a large tree, the bark of which is used for tanning leather, to the infusion, which I supposed contributed to render it a more powerful febrifuge.

The white arsenicated drops, prepared as directed in the London Medical Journal, succeeded very well in a few cases of inter-mittents, but it has not been brought into

* The bark of the *prunus spharospermus* is remarkably astringent, probably more so than the oak bark. It is used in decoction to check diarrhoea or lenteria.

general use yet in these islands. It bids fair however to be a useful remedy among the negroes, and robust hardy people. The safest method of using it in the West Indies, where the nurses are generally negro women, is to mix it with water, so that a table spoonful of the mixture may contain five drops, by which means mistakes will be avoided.

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CHAPTER III.

SECTION I.

Of the Typhus Fever.

Few cases of the real Nervous Fever have occurred in this or the other islands, as I have been informed, for many years past. When it has occurred in this island, keeping the patient open in his bowels, blistering the head repeatedly, giving a decoction of bark and snake root, and supporting the strength with nourishment and wine, were the means employed for the cure; and in general with success. Two cases occurred where the disease was protracted to the twentieth day, and both recovered. In some of the other islands, as I have been informed by medical gentlemen, it has been treated with great success, by throwing cold sea-water over the patients, three or four times a day, in the manner directed by Dr. William Wright, late of Edinburgh, now physician to the army in

the West Indies, a situation he is well qualified for.

SECTION II.

PLEURISY, Piripneumony, and Catarrhal Fevers, and Gastritis, &c. have not occurred often in this island. When there are evident symptoms of local inflammation, bleeding largely and frequently is absolutely necessary, especially in the pleurisy; and strong doses of the antimonial or James's powder and calomel were given afterwards, otherwise the disease proved speedily fatal. Fomentations and blistering the side affected must not be neglected; and cooling emollient drinks, such as barley-water with ockra, to which some nitre is added, should be given frequently. The blood in this and the hepatitis, which has occurred often in this island*, had always a thick inflammatory buff upon it. If bleeding is not used very

* See my paper on abscesses and diseases of the liver in the West Indies in Decade 2d, Vol. IV. p. 317, of Edinburgh Medical Commentaries.

early and plentifully in gastritis, a mortification of the bowels soon follows, and the patient is carried off in the course of three days illness.

A catarrhal fever, called a cold, seldom requires bleeding; but a dose or two of *P. antimonialis* or James's powder is very often necessary to remove it. Ten grains of the former, or six of the latter, was the common dose given to grown people.

Bleeding in the acute hepatitis should be employed very early and largely, as well as in the pleurisy, to prevent an abscess forming in the liver.

As the dysentery generally prevails at the same time that remittent and intermittent fevers do, in the West Indies, and probably proceeds from the same cause, I shall next give a short account of the method of treatment that I have found most successful in that disease for many years past.

CHAPTER IV.

SECTION I.

Of the Dysentery.

THE accurate description that has been given of this disease by so many eminent authors, renders it unnecessary for me to enter upon the diagnosis; I shall therefore proceed to the method of cure.

I have never found occasion to use venesection. If the fever ran high, and the excruciating pain and griping in the bowels were not relieved by warm fomentations and emollient clysters, the semicupium was ordered, which never failed to alleviate them for a time, but it was seldom repeated, as it evidently weakened the patient: on which account, when the pain returned with violence, a blister was generally applied over the abdomen. While these applications were employed to palliate the
disease,

disease, an infusion of ipecacuanha in the following form was preparing, viz.

R Pulveris. crassi. radicis ipecacuanhæ ʒij. aquæ bullientis ʒviij. Macera in vase fictili per horas quatuor. Cola liquorem, et capiat cochlearea vi. vel viij. statim et iv. omni semi hora donec vomitus excitetur.

About one half of this infusion was given as soon as possible, for time is as precious in this disease, as it is in all those already treated of; and if that quantity did not excite vomiting or great nausea in half an hour, four spoonfuls more were given, and so on till it operated upwards and downwards. It should be observed, that this quantity was ordered for an adult, one half being sufficient for weakly or young people. The dose was always easily proportioned to the age and strength of the patient, as it never operated with violence, even when given in large doses. When the sick strained much in vomiting, a few cups of camomile

camomile tea or warm water were ordered; but if they vomited with ease, no liquid was ordered to excite it. Chicken water, very thin sago, or jelly of the arrow-root starch, was given for drink and nourishment afterwards; emollient clysters were thrown up twice or thrice a day, and sometimes an anodyne was ordered at night.

The same ipecacuanha was infused for four hours or all night, and the infusion repeated next morning, and frequently it was infused a third time, and given the third morning; but two infusions generally answered the purpose of cleansing the primæ viæ, and from twenty-five to forty drops of laudanum given in two ounces of the same infusion at night, for several nights after, very often completed the cure. If this infusion did not operate sufficiently by stool, which it seldom failed to do, an ounce and a half of the oleum ricini, made up in the form of an emulsion with gum arabic or the yolk of an egg, was given on the second or third day, and the infusion with laudanum was continued at night, or the
same

same number of drops were added to a starch clyster. A solution of sal cathartic amarus in mint water, was sometimes ordered as a purgative, which answered very well when it remained on the stomach, but as that was not often the case, the castor oil was generally preferred. The continuance of the anodyne in the above form for three or four nights more, together with emollient lubricating nourishment and drinks, was all that was necessary in common cases to remove the disease.

But when it was very violent from the beginning, or had made great progress before the patient was visited, the infusion was given, and repeated till it had operated very well by stool; the anodyne, as mentioned before, was ordered every night, and the following decoction given in the day-time, viz.

℞ Pulver. crassi. corticis. Peruvian. ʒij.

—— Catechu vel gumi. kino. ʒij.

Aquæ fontan. ℔ij. coque leni igne
ad

ad ℥ij. cola et adde ol. cinamom
guttas iv.

Capiat ℥ij vel ℥iij secunda vel ter-
tia quaque hora.

When the disease did not yield to this treatment in two or three days, some affection of the liver, occasioning a vitiated secretion of the bile, was suspected to be the cause of it; and if on examination that viscus was found to be enlarged, hard, and painful when pressed upon, a calomel pill with opium was given three or four times a day; and when there seemed to be danger, and the case became urgent, a dram of strong mercurial ointment was rubbed in frequently at the same time, till the gums were affected. The pills were made up in the following form:

℞ Calomelanos pp^u ʒj

— Opii puri gr^a iij. in aquæ q. s.
soluti.

— Ol. cinamomi guttas iv. misce et
divide in pilulas xv

Capiat unam ter de die.

If

If frictions of mercurial ointment were used at the time these pills were ordered, two were sufficient in the twenty-four hours; but if the cure was trusted entirely to the pills, three or four were given in that space of time, till a foreness of the gums came on, or until the disease was removed. During this course the decoction of bark was continued, to prevent a putrid tendency in the disease; and nourishment of the most lubricating kind, sometimes with wine, to support the strength of the patient, was ordered. The patient was well watched, and the mercury immediately suspended, if it affected the gums.

The chronic hepatitis, as I have observed in a former publication *, was almost constantly preceded by a purging of vitiated acrid bile, which very often brought on a dysentery, and an abscess of the liver always followed, if mercury was not administered early in that disease. Sago and panada were used as nourishment for the sick; but, of

* Edin. Medical Commentaries, Decade 2d, Vol. IV. p. 317.

late years, the starch of the maranta or arrow-root of the West Indies has been used as an emollient aliment, when made into a jelly, for people afflicted with dysentery, or any other complaint of the bowels. Wine, sugar, and spices were added to it, as was found necessary, and sometimes milk. This starch has been found remarkably useful in such complaints, often removing them without much assistance from medicine. The utility of it has been confirmed by experience, and having been found preferable to sago, in all cases when both were used, the cultivation of it ought to be encouraged; and if the importation of it from our colonies, could be permitted under certain restrictions, it would be found much preferable to every other aliment in disorders of the bowels, and might be employed as such in our hospitals, and in our navy and army, and thereby prove a great saving in the article of sago and salop, now in such general use. The starch of the arum esculentum, called eddo or tanier in the West Indies, is equally fine and pure, and would probably be as beneficial as that of the arrow-root, but

but it has not been so often tried. In some cases of complaints of the bowels, this root has been found very useful, and being more productive in the article of starch, it could be prepared at a much cheaper rate, and would probably answer the same purpose.*

When a diarrhœa or lenteria followed the dysentery, the arrow-root starch with milk and a milk diet, seldom failed to remove it, and restore the sick to health. It was very often necessary to use lime-water, at the same time, in the milk; a pint a day taken by degrees mixed with milk was sufficient, and assisted in forwarding the cure. The decoction of bark with astringents was used for some time, when the milk diet was not thought advisable. Sometimes a very weak decoction of simarouba, or an infusion of quassia root in water, was taken daily to the quantity of a pint with good effect. The quassia root was also infused in port wine, and

* See my paper on the comparative quantities of starch, produced from the roots of West India plants, used as food by the inhabitants, published in the London Medical Facts of this year.

a wine glass full of it given three or four times a day with advantage. Wine was never used after a milk diet was begun. Flannel was ordered to be worn over the abdomen of those recovering from this disease, to prevent a relapse; and it is necessary to avoid vegetables and acid fruits, and to pay great attention to diet, with the same view.

SECTION II.

General Remarks.

IN the treatment of the dysentery, I have chiefly trusted, for many years past, to the early use of ipecacuanha infused in the manner before directed; and I can take upon me to aver, that this practice has been attended with extraordinary success. This may be considered as only the renewal of an old practice, viz. that of G. Piso, which I do not deny; but I think it of little consequence whether a practice is old or new, provided that it is found by experience to be successful. Many may probably assert, that
ipecacuanha

ipeccacuanha in powder given in small doses, has been equally successful in curing the dysentery. To which I shall only reply, that I have not found this to be the case. The powder seldom purges, or so little that purgatives must be had recourse to, by which time is lost. The infusion always purges effectually, and its effects are more durable than those of the powder, and it does not fatigue or weaken the patient. It may probably impart to water its chief virtues, as the Peruvian bark does, but the preference appears to depend on its action as a gentle emetic, and a powerful purgative, at the same time, without inducing debility, by which means the disease is not allowed to gain ground nor to fix on the bowels, which a dilatory method of treatment permits it to do, and when this had been the case it too often resisted every remedy that was tried. Tartar emetic induces debility, and, on that account, should never be employed in this disease in hot climates, where the strength is so quickly exhausted, and frequently cannot be restored again by any means in our power.

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I have placed my next great dependence on mercury for the cure of this disease. It often proceeds from obstructions or a chronic inflammation of the liver, which occasion some derangement of its secretory or excretory organs, the cure of which can only be effected by this remedy. In general, when a disease occurs in the West Indies, with such ambiguous symptoms, that it cannot with certainty be referred to any particular class, some affection of the liver may be suspected, and under such circumstances this really happened very frequently to be the case.

A gentle course of mercury for bilious complaints, even where there is no evident hardness of the liver, will generally prove beneficial to health in hot climates, where this viscus is so often the seat of diseases, which can only be removed by that powerful remedy, as far as we yet know.

CHAPTER V.

Of the Dry Belly-Ach.

SECTION I.

History of the Disease.

THIS is the most painful of all the diseases to which the inhabitants of the West Indies are liable. — It begins with a sickness at the stomach, and great uneasiness about the umbilical region, which abates and returns at intervals of between ten minutes and a quarter of an hour, which become more violent every time, till at last a severe retching and vomiting comes on, which is renewed as often as the pain returns. — Equal compression over the abdomen gives a temporary relief from pain, and this circumstance, with the absence of fever and the want of a distention of the bowels, are the leading symptoms that distinguish this disease from the gastritis.

The bowels seem to be contracted and drawn backwards, or cramped as the patient generally expresses it. In the course of twelve or twenty-four hours the pain sometimes becomes so excruciating, that the poor sufferer falls into convulsions, which is always a symptom of great danger, and in which I have known instances of people expiring.—The torments of those labouring under this disease are beyond conception, and excite the commiseration of all who attend them; which is probably the reason, that practitioners have so often recourse to opium for their relief.—A difficulty of voiding the urine comes on, and sometimes a total suppression of it.—Clysters are never retained long, and when the disease continues for twenty-four or thirty-six hours with great violence, the anus is often so much contracted, that a clyster-pipe cannot be introduced, without great difficulty. The retching and vomiting frequently became so violent, that even anodyne draughts were instantly thrown up. The pulse was always natural during the first twelve or twenty-four hours of the disease,

ease, but generally became quicker and weaker afterwards.—The heat of the body was natural at first, but after two or three days continuance of the disease, it was much under the natural standard; and often accompanied with cold sweats. Obstinate costiveness always prevailed, and the common means to procure stools were often employed with unremitting assiduity for four or five days to no purpose. I have been called to some patients who had been in torture for seven days without having had a stool; and I visited one the eighth day, who had not had an evacuation by stool all that time, but it was then too late to afford him any relief, for a mortification of his bowels had taken place, and he died the next day. The fatal termination of the above case, in this way, induced me afterwards to take eight or twelve ounces of blood from robust people at the commencement of the disease.—Few cases, however, occurred that required venesection, as the people afflicted with it had generally a pale yellow complexion, and were more or less swelled or bloated from drinking grog, drams, or

strong punch.—Only the lower orders of the white people in the West Indies, and the negroes, who cannot afford to drink old rum or wine, are subject to attacks of this disease.

Relapses happen very often, and sometimes bring on a degree of palsy, which is more or less difficult to be removed, in proportion to the preceding attacks. Although every patient suffers extraordinary pain during the attacks, yet there is great variety in the degrees of violence.

It is by no means a dangerous disease when attended to at the beginning, but its frequent recurrence often wears out the constitution, impairs the faculties of the mind, and renders a removal to a temperate climate absolutely necessary. Or to those who have not the means to enable them to go to Europe or America, a total abstinence from spirituous liquors should be ordered, and even enforced, if possible; and drinking the hepatic or Souffriere waters,

waters, which are to be found in most of these islands, should be strongly recommended.

SECTION II.

Of the Cure.

WARM fomentations, applied to the abdomen, afforded only a momentary alleviation of the pain, as did the semicupium, which always weakened the patient and was seldom repeated.—Clysters were always given and frequently repeated, but to little purpose.—A blister applied over the epigastrie region sometimes stopped the vomiting, by which means mild purgatives, as sal. cathart. amarus, or an emulsion of castor-oil was retained on the stomach, and being frequently repeated, had at last the desired effect.—But as blistering had not often this good effect, and tended to increase the sufferings of the patient, I have laid it aside for many years past.—Drastic purges always increased the vomiting, and never answered the purpose for which they were given.

Two grains of solid opium generally settled the stomach and allayed the violent spasms in the bowels, after which an emulsion of castor-oil, given and repeated at proper intervals, sometimes succeeded in procuring stools, although never till after many hours perseverance in the use of it.

When this gentle method of treatment did not answer in the course of forty-eight hours, or three days at most, I gave small doses of calomel, such as three or four grains joined to a little jalap, or extr. catharticum, twice or thrice in the twenty-four hours, not daring, when a young practitioner, to prescribe larger doses for fear of weakening and thereby hurting my patients.—When the calomel was given in such small doses it always affected the mouth, and although it never failed to remove the disease, even sometimes before stools were procured, it was attended with great inconvenience and uneasiness to the sick.—The mouth, tongue, and throat were often much swelled, and the ptyalism frequently became so very violent, notwithstanding all the

the means employed to restrain it, that the patients not only suffered much pain, but were often alarmed at their situation.—I found all those who were attacked with this disease, as easily and readily affected by mercury as scorbutic patients are.

Although in my practice, no bad consequences ever followed a salivation, I found it so distressing to the sick, and also so very disagreeable to myself, that, after repeatedly experiencing the same effects from this method of treatment, I was induced, when the case became urgent, and there appeared to be danger, to prescribe a full dose of calomel at once, in hopes that it would operate so speedily by stool, that the salivary glands, &c. would not be affected by it. Fifteen grains of calomel were made up into four pills, or into a bolus, with some aromatic species, and given at once; and in many cases where the disease had continued five or six days without stools or any relief of the pain, a scruple of calomel was made up and given in the same way, which never failed to open the bowels in about five or
fix

six hours, and removed the disease without bringing on a salivation; but the gums and mouth were generally more or less affected for several days after.—In some desperate cases, when called after all the usual means had failed, and the pain and constipation had continued for seven or eight days, I have prescribed half a dram of calomel to be made up into eight pills, which were all to be given in the course of four or five hours, if stools were not procured by the first six before the first period; and this bold practice was always attended with success; which, if not attempted, the disease would have certainly proved fatal.

Nourishing soup, caudles, and mulled wine with spices, were necessary to support the sick, after the alvine discharge commenced, and if they became weak and faintish, an anodyne draught was ordered to restrain the immoderate purging and violent tenesmus.—Emollient clysters were thrown up daily, sometimes with laudanum if the tenesmus continued, and a lubricating diet, such as sago, or arrow-root—Starch
jelly

jelly with wine was ordered for several days after. When the strength was restored, a table spoonful of castor-oil was given occasionally, if the patient was threatened with costiveness.—The bark, which is so often prescribed in some form or other, to those recovering from other diseases in tropical climates, as a tonic, and with such good effect in restoring the appetite and strength, has been found hurtful after this disease, by bringing on relapses, or at least I thought they were often occasioned by it, and have therefore laid aside the use of it.

Palsy succeeds a very severe and long continued attack of this disease, or proceeds from frequent relapses of it. To prevent which, the cure should be attempted by calomel as speedily as possible, and relapses avoided by keeping the bowels open afterwards.

Small doses of cathartic salts, two or three cathartic extract pills occasionally, or castor-oil as mentioned before, answer this last purpose best.

Our

Our Souffriere waters, which are aluminous and contain much hepatic gas, have had a good effect in preventing relapses and curing the palsy proceeding from lead. I have given thirty or forty drops of balsam. peruv. on sugar, to those recovering; once or twice a day with seeming advantage.

There can be no doubt that this is the same disease as the colica pictonum, or Devonshire colic, proceeding from a solution of lead, or from the fumes of it, by living in painted houses; as it has been observed, that all house-painters have the disease more or less in the West Indies. It has not prevailed so much of late years as it did fifteen or twenty years ago, owing probably to the great attention that has been paid to curing the rum before using it; and perhaps also to the still necks and worms being generally now made with a mixture of tin, instead of lead as formerly, by the hardness of which, a solution of lead in the high proof hot spirit, when passing through these, is prevented; or if any particles are taken up, they subside on the evaporation of the fiery

or volatile parts that suspended them, in the operation of shifting, or curing rum, as it is called *. In confirmation of this it has always been remarked, that the drinkers of new rum only are afflicted with this disease, or those who live in newly painted houses, or such as are employed in painting with white lead, as was observed before.

* The new rum runs from the still into five gallon cans, which is thrown into butts, from thence it is drawn off into tubs and put into puncheons, and shifted from puncheon to puncheon every month or oftner, if wanted soon for use, by which its empyreumatic taste and smell, called haut-gout, is removed; this is what is called curing. It is shifted only once every four or six months when not wanted very soon. Various methods have been tried for the speedy curing of rum, or giving it that perfection which it attains by age and shifting, such as the addition of burnt sugar or rice, and green tea; but within these few years past, it has been discovered that nothing is so efficacious in bringing it to an early maturity, as a few handfuls of powdered charcoal thrown into each puncheon every time it is shifted, which both improves the colour, and removes the haut-gout.

CHAPTER VI.

Of the Cholera Morbus.

THIS disease begins with a vomiting of thick yellow bile, and a violent discharge of the same fluid by stool soon follows.

The vomiting and purging increase every moment in violence, and the sick are frequently quite exhausted, their pulse sunk, and their extremities cold, before any medical assistance is called in. This often happens in the course of a few hours from the first attack.

In such cases, no time is to be lost in administering opium, and as it will seldom remain on the stomach in a liquid form, and takes a considerable time to dissolve when given in pills, it becomes necessary to throw up fifty or sixty drops of laudanum in a clyster immediately, and to give a grain of solid opium

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at the same time, which must be repeated every hour till the vomiting ceases. When the case is not so very urgent, an epithem of mint stewed in wine, and applied warm over the pit of the stomach, giving at the same time two grains of opium in a pill, generally puts a stop to the disease in an hour or two. Although this is by no means a dangerous disease, when attended to in time, yet as instances have occurred of its proving very quickly fatal when neglected, the speedy administration of opium ought never to be omitted. It always proceeds from a redundant, and sometimes vitiated secretion of bile. It generally happens also in very hot weather; and eating large quantities of fruits and vegetables, is often the immediate cause of it. If a yellowness of the eyes and skin appears after, which is sometimes the case, a few grains of calomel ought to be given for two or three days, when the strength is restored, and a dose of Epsom salts or castor-oil afterwards. Directions should be given to the sick, to avoid eating vegetables or fruits for some time after.

A vomiting

A vomiting and purging frequently comes on, from eating a quantity of vegetables, unripe fruits, or any thing else that has disagreed with the stomach, but as little or no bile is discharged, and this disorder seldom becomes dangerous, it is called an Indigestion, and is cured by drinking plentifully of camomile-tea or warm water. An anodyne draught is sometimes necessary to allay the irritability of the stomach, and small doses of magnesia and rhubarb were generally prescribed afterwards to restore its tone, and to correct acidity, which always accompanies this disease.

It generally happens also in very hot weather, and sometimes in cold weather, that after eating large quantities of fruits and vegetables, is often the immediate cause of it. The eyes and skin turn yellow, and a yellowish appearance is sometimes the first sign of it. A few grains of calomel ought to be given for two or three days, when the strength is restored, and a dose of Elix. of R. should be given. Directions should be given to the child to avoid eating vegetables or fruits for some time after.

CHAPTER VII.

Of the Tetanus, or Locked Jaw.

IN my opinion this dreadful disease ought to be divided into two species, the Idiopathic and Symptomatic, as the former often admits of a cure, whereas the latter, proceeding from a lésion of nerves or tendons, has, from my own experience, and that of all my medical acquaintance in the West Indies, resisted every remedy hitherto tried, having always proved fatal.

SECTION I.

History of the Disease.

THE idiopathic tetanus, proceeds from sleeping on the cold ground in the night in damp places, or from getting suddenly wet after having been much heated, or from remaining long in wet clothes, and lying out in the cold dew. But as it happens most fre-

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quently to negroes, the cause can very seldom be discovered.

The symptomatic comes on after pricks of nails or fish-bones in the feet, or from splinters of hard wood running into the feet or hands, or from cuts of glass bottles in the soles of the feet or about the toes. Also after pricks of swords, and after gunshot wounds in the extremities, especially about the feet and ankles, after compound fractures with splintered bones, and after amputations of arms, legs, fingers, or toes. In both species there is a remarkable coldness in the hands and feet, and also cold sweats, but more especially in this last. This disease does not always, however, follow such punctures or lésions from accidents, or come on after operations.

I have never met with the *emprosthotonos* in either of the species. It always began with a stiffness of the muscles of the neck and the lower jaw. The jaws cannot be opened more than a quarter of an inch asunder. The head is frequently drawn
back,

back, and at the same time the jaws are shut close. These spasms return more frequently, and with greater violence, as the disease advances, till in forty-eight or seventy-two hours, if it continues so long, the teeth are so closely shut that nothing can be got into the mouth; the spasms become almost incessant, every muscle of the body is in violent action, till at last a general convulsion, in the symptomatic kind, puts a period to life. I knew two instances of this disease being brought on by small fish-bones sticking in the throat for some time, and a negro who had it after being stung in the glans penis when asleep, by a large wasp called jackspaniard, in the West Indies. They were all attacked on the eighth or ninth day after and died.

As the trismus infantium or jaw-fall, as it is called, never happens to infants after

Although the sick had great difficulty in swallowing during the spasms, they appeared to have no aversion to water, or any other fluids, as is the case in the hydrophobia; nor did they flaver, or show any symptoms of furious delirium.

the ninth day of their age, it may be considered as a third species of this disease.

SECTION II.

Of the Cure.

THE idiopathic tetanus was sometimes cured by warm frictions, wine, opiates, and bark. But I have succeeded best by mercurial frictions, used every two hours all over the neck and spine in very large quantities, as mentioned in a former part of this work, until the mouth was affected by it. The mercurial ointment was seldom weighed, or the laudanum dropped in this disease. Calomel was mixed with syrup, and given with the laudanum when the patient could swallow it. Wine was always given in large quantities, and also nourishing clysters. This method has often succeeded in removing this direful disease. The cold-bath never answered with me, although I have frequently tried it. I have often wished to try electricity, but never had an apparatus in perfect

perfect order till lately, since which no cases have occurred.

In the symptomatic kind, the punctures or cuts are generally healed, and after operations the stump looks well, before the disease comes on, which (when it takes place) is always on the eighth, ninth, thirteenth, or fourteenth day after the accident, or operation, as I have never known it to come on after the fifteenth.

As tetanus attacks more frequently at the first period mentioned above, than at the second; when the first passed over I had hopes of recovery, but after the fifteenth day I never hesitated to pronounce the patient out of danger from this disease. When it unfortunately came on, I employed all the means before described for the recovery of the idiopathic kind, besides opening and scarifying the parts that had been punctured or cut, and sometimes destroying the nerve above the place, dressing the parts with mercurial ointment, and the stump with the same after operations,

pouring laudanum over the lint, and giving it by tea-spoonfuls to drink, pushing the mercurial frictions to the utmost extent, and giving plenty of wine; but all to no purpose. The extremities were often rubbed with mustard, Cayenne pepper, and ginger, steeped in rum, &c.

As I found, from sad experience, that I could never cure this very dreadful disease, I thought of trying some method of preventing it. It occurred to me, that, probably owing to its very rapid progress, there was not time to throw a sufficient quantity of mercury into the system, to cure or overcome the great irritability or tendency to violent spasmodic contractions in the muscular fibres. And as mercury seems to act as a powerful antispasmodic in some other diseases, I was disposed to give it a fair trial after accidents and operations, to prevent tetanus, knowing of no other remedy so likely to produce that happy effect.

After wounds or punctures I therefore gave two or three grains of calomel twice a-day, and dressed

dress'd the part with mercurial ointment, from the day these accidents happened till a gentle salivation came on. And after operations I gave three grains of calomel every night with a grain and a half of opium, and three or four doses of bark in the day-time, without regard to the symptomatic fever, till the mercury affected the mouth, which was generally the seventh or eighth day, when I gave the calomel every second night only, and continued the opiate and bark till after the fifteenth day, when all was laid aside but anodynes. When the mercury did not begin to affect the mouth the seventh day, I ordered some mercurial ointment to be applied over a part of the stump, which seldom failed to bring it on. Out of fifteen patients, after amputations, that were treated in this way, only one died, and he was in such an irritable state before the operation, that I dreaded the consequence, and was averse to its being performed. He was seized with symptoms of the tetanus the eighth day, and died the ninth at night.

I do not pretend to assert, that the reco-

very of so many patients after operations, in the West Indies, was entirely owing to this method that I have employed for the prevention of the tetanus. In such trials nothing can be proved with certainty. The proportion of men who recovered by this method after operations, is much greater, however, than is customary in the West Indies, viz. nearly three to one more than by the common method of treatment, as far as I have had opportunities of observing. Its success will, therefore, I hope, recommend it to the attention and trial of the medical gentlemen of the navy and army in the West Indies. It cannot prove hurtful, and from comparing cases in my private practice, I am convinced of its utility. I have succeeded in a double proportion by this treatment, with those who had been wounded or punctured, having only lost two out of a great number since I began it.

For many years after my arrival in the West Indies, nearly one-fourth of the negro children on the plantations, died of the trismus, or jaw-fall, on the eighth or ninth day

day after they were born. It therefore became a matter of serious consideration with the planters, to find out a method to prevent this mortality among their negro children. That the disease could not be cured was soon discovered, as not a single instance of such an event ever occurred. The cause was supposed to be meconium in the bowels, or thought to proceed from the bad instruments that the negro midwives used in cutting the navel-string. The infants were purged with castor-oil or magnesia, to remove the meconium as soon as possible; the midwives were furnished with sharp scissars or razors, and shewn the proper method of cutting and tying the navel-string. But all this did not answer my expectations. I observed that the children born in large negro-huts generally recovered; and that white children, or those of free people, who had their kitchens apart from their dwelling-houses, escaped the jaw-fall; I therefore suspected that the smoke from burning wood, was the cause of it. In consequence of this I gave orders that no fires should be allowed in the negro-houses where the lying-in women were; which answered the purpose of preventing

preventing the disease, when the order was complied with; but negroes are so fond of fire that they often lighted it up by stealth, and thereby frustrated my plan. I then recommended a lying-in-hospital to be built on every estate, near the negro-houses, with a planked floor, so that no fire could be kept in it; since which no children, who were born in these hospitals, and remained with their mothers in them for nine days, have ever been attacked with this disease. I wish to recommend such hospitals on every plantation in all the islands. The negro women, however, often elude the hospital, by concealing their pains till they cannot be moved from their own houses; this proceeds from a love of home, or from jealousy of their husbands; but by perseverance, and carrying them to the hospital after they are delivered, all this may be overcome.

It is remarkable, that infants are never attacked with it after the ninth day of their age, as was observed before.

The fires in the West Indies are made of wood, and the smoke from them is so stimulating

lating to the eyes, that few white people can bear it for a moment. From the foregoing observations I am of opinion, that the smoke of wood used as fuel in small huts where it has not a proper vent, is the cause of this disease among infants in some parts of Switzerland and France, and in the Highlands of Scotland, as well as it is in the West Indies.

THE
 CHEMICAL ANALYSIS
 AND
 MEDICAL PROPERTIES
 OF THE
 HOT MINERAL WATERS
 IN THE
 ISLAND OF *DOMINICA*;

WITH SOME OBSERVATIONS ON VOLCANOS IN THE WIND-
 WARD AND LEEWARD WEST INDIA ISLANDS.

THE Souffriere Waters, proceeding from a volcano on the south end of this island, have been used for various disorders with good effects for many years past; but from the best information I have been able to collect, no chemical analysis of them had ever been attempted. I had been there on visits to sick people frequently, but had not time to examine these waters in a chemical way; I therefore made, at this time, two excursions for this express purpose.

These

These mineral waters are hot, issuing from the side of a very steep ridge of mountains about two miles from the sea, forming a small rivulet which runs into it. Near to the sea-side some of the subterraneous hot waters find an outlet, and keep constantly bubbling up. This hot sulphureous water, and the water of the rivulet now become cold, may be felt at the same time. There are three craters, the uppermost of which is the largest; there the waters boil up most violently, making a rumbling noise like distant thunder, smoking much, especially in rainy weather. In all the volcanos the water is quite black, when it issues forth from the subterraneous boilers, but soon after it turns of a pale cream colour, leaving a whitish slimy crust upon the stones below its surface. The parts of the stones above the surface of this water, are covered with a brownish or dark yellow crust, resembling ore. The bottom and sides of the channel of the rivulet, are covered with a white earth or clay, and small porous white stones. On each side of the channel, a number of small openings, like chimnies to furnaces, were

were observed, from which hot black vapours are constantly issuing. It is dangerous to approach a place where a number of these smoking openings are collected, as the ground is hollow below, and the heat of the steam is equal to that of boiling water. On the banks of the lower rivulet, great quantities of crystallized sulphur are found, and a quantity of alum, sometimes pretty pure, and at other times mixed with clay or earth; it has, however, more the appearance of burnt than common alum.

The water has a strong astringent taste, and a sulphureous smell, when taken near the source, but it loses the smell after running for two or three hundred yards, when it becomes cooler, turns white, and much clearer. At the source of the lower Soufriere, the water as it issues from one of the craters (for there are great numbers) raised Fahrenheit's thermometer in one minute to 205 degrees. There we found a large boiler filled with black coloured round bullets, from the size of swan-shot to that of pistol-

§

balls,

balls, floating in the water, and in perpetual motion from its ebullition. These, when lighted with a candle, burned away with a beautiful purple flame, and emitted strong sulphureous vapours, which tinged silver black in a few seconds. Pure sulphur was formed round the forceps that held these balls during their combustion; the small portion of matter that remained seemed to be earth or clay. Boiling water did not dissolve these balls thoroughly, but the water was impregnated with all the sensible qualities of the Souffriere waters brought from the spot. About 100 yards below this crater the thermometer, placed in the stream of the rivulet, rose to 130 degrees: five gallons of water were taken from this place to be analysed. Where the baths now are, is about 300 yards below the first source of the water. The thermometer put into the water at this place rose to 106 degrees, which upon several trials was found to be the medium heat there. The source of the second Souffriere is about a quarter of a mile from the first, and the third Souffriere is still higher up, on the side of the same steep mountain. The second is about 200, and the third 300 yards

yards above the level of the sea. A strong solution of the vegetable alkali precipitated a white powder from these, and a large quantity of cerussa was also thrown down by a tea-spoonful of acetated lead, which we had found to be exactly the case with the water of the lowest Souffriere. From appearances, and the taste of these upper waters, we supposed they contained more iron than the lowest, but upon trial with astringents, &c. we did not find that to be the case. The streams of these two boiling outlets take a different course from the lowest, but they all unite before they reach the sea.

The land is very rugged and stony, and the heat in the day-time here in dry weather is almost insupportable. In our second excursion, when walking in the sun about two o'clock, P. M. near the middle Souffriere, Fahrenheit's thermometer rose to 120 degrees, and when put upon a stone exposed to the rays of the sun, while we rested ourselves under the shade of a tree, it soon rose to 138 degrees, which will appear almost

almost incredible, but is a fact, and what is perhaps equally surprising, that although exposed to this extraordinary heat for several hours, we suffered no bad consequences from it *.

The vapours from these volcanos are quite black and very offensive, and occasion violent head-ach and faintness to people exposed to them for some time, but they do not appear to hurt vegetation. The upper crater makes a greater noise than the others, and throws out the steam with greater violence, but I did not observe any stones or lava thrown up when I was there; however, I am not certain but this may be the case at times, from the appearance of the lava at some distance from the crater. There appears formerly to have been a great number of Souffrieres in this quarter of the island, which are now extinguished; but along the sea-side hot water is found

* Mr. William Bremner, a medical gentleman of this island, accompanied me on this occasion, and assisted me in analysing the waters.

L

bubbling

bubbling from under the rocks in many places, which have the same sensible qualities as these I have described.

Chemical Analysis of the Souffriere Waters.

III. The Effects of Re-agents.

Experiment 1. The vitriolic acid had no sensible effect whatever upon them.

Expt. 2. Neither had the muriatic.

Expt. 3. A silver coin immersed in the water was not tarnished.

Expt. 4. The tincture of gall-nuts or strong proof spirit had little effect upon the water, after having been exposed to the air for several days. But when it was heated, the tincture tinged it of a dark green colour, which by standing for some time became moderately black. When a few drops of the tincture was added to a strong solution of the balls formerly mentioned, in boiling water, a very black ink was formed in a short time.

A small quantity of the aqueous infusion

tion of the rind of the pomegranate fruit, added to the solution of the bails as above, produced a very dark ink fit for writing in the space of two hours. A shining purple-coloured scum was formed on the surface of this solution, after the addition of the astringent infusion.

Exp. 5. With the Prussian alkali. A few drops of this turned a glass of the water of a beautiful purple colour; and by adding some more, a large sediment fell to the bottom of the glass, which was evidently Prussian blue.

Exp. 6. The fixed vegetable alkali threw down a fine whitish coloured powder, without effervescence.

Exp. 7. Lime water produced the same effect as the former.

Exp. 8. The caustic alkali occasioned a thick greenish cloud in the waters, which remained suspended in the glass for a long time, and after subsiding to the bottom turned of a very dark green colour.

Exp. 9. The volatile alkali effervesced a little in the water, and occasioned a green cloud in it as in the former experiment;

but after subsiding it did not turn so dark, nor was the sediment so great. After standing for some time a thick scum formed on the top, which was evidently iron, and the clear fluid below had a very strong chalybeate taste.

Exp. 10. By a few drops of acetated lead, a white powder was precipitated from a wine glassful of the water, which had a sweetish taste, but seemed to be twice the quantity of cerussa that could have been suspended by the vinegar.

Exp. 11. Muriated barytes turned the water white, and precipitated a white heavy powder. It did the same when added to hard water, although not in such a quantity; when added to pure rain water there was no sediment.

Exp. 12. Lacmus turned a wine glassful of the water of a light red colour—hard water was also turned a little red by it—but pure rain water, by adding a little of it, was turned to a beautiful blue colour.

Exp. 13. Nitrated mercury precipitated a large quantity of a beautiful orange coloured powder—when the nitrous acid was afterwards

afterwards obtained very pure, the quantity of this precipitate was not so considerable.

Exp. 14. This precipitate turned brown when lime water was poured upon it.

Exp. 15. This last powder dissolved entirely in the muriatic acid.

Exp. 16. Acid of Sugar. This made no change whatever upon the water, when added to it in small or very large quantities. —after standing for some time, the water turned rather whiter than it was before, but so little that it is not to be relied upon.

It is worthy of observation, perhaps, that a solution of the sulphureous balls formerly mentioned, in pure hot water, exhibited precisely the same chemical phenomena, with the re-agents that the natural Souffriere waters do.

Distillation and Evaporation of the Souffriere Waters.

Exp. 17. About two gallons of the water, were put into a retort with a receiver not

luted, while the distillation was going on, black offensive vapours came over, which tinged a silver coin quite black, in the same manner that the steam at the source of the Souffriere waters did. The distilled water in the receiver was quite pure.—I had not a proper pneumato-chemical apparatus to collect and examine this gas by, but this is perhaps of less consequence, as it clearly appears to have been hepatic or sulphureo-hydrogenous gas.

Exp. 18. When the water in the retort turned muddy, a Florence flask was filled with it, and being evaporated to dryness, there remained a fine white tasteless powder. Some of this powder was washed in high proof spirit and dried again. Neither this powder, nor the residue produced by the other re-agents, were inflammable.

Exp. 19. A part of this powder was mixed with water in a wine glass, and vitriolic acid poured upon it, which, after standing a day, began to crystallize on the sides of the glass, and formed a neutral salt, which was evidently alum.

Obser-

Observations.

From experiments, Nos. 2, 3, it appears that there is no real hepatic sulphur in these mineral waters; but from exp. 7, it is plain and evident that they abound with hepatic gas, or, according to Mons. de Fourcroy, being only impregnated with that gas, they may be termed hepaticized thermal waters.

Exp. 4. And more particularly exp. 5. shew that they contain iron suspended probably by the vitriolic acid, as appears from expts. 11 and 12. Heat seems also to have some power in keeping the iron dissolved, as great quantities of ocre were deposited on the stones in the rivulet, when the water became perfectly cold. They seemed then to possess only a weak impregnation of that metal.

Exp. 6, 7, 8, 9, 10, prove that an earth is suspended by an acid, and the synthetic exp. 19 proves that acid to be the vitriolic, and that earth to be clay, of which there

is more than sufficient to saturate the acid. The yellow precipitate produced by the nitrated mercury, is not so easily accounted for. The hot waters at Bath produce the same phenomenon with this solution of mercury, according to Dr. Charleton's analysis; but it does not appear to proceed from an alkaline principle in our Souffriere waters, as he asserts it does in the waters at Bath, as is clearly proved from exp. 16. the acid of sugar being the best test for discovering calcareous earth, or any other alkaline earth.

It appears from exp. 15. that this precipitate was Turpeth mineral, as it dissolved entirely in the muriatic acid, from which, probably, corrosive sublimate might have been obtained, if there had been a sufficient quantity collected to have tried the experiment. These waters are strongly impregnated with alum, with excess of a fine white clay, pure hepatic gas, and vitriolated iron; from which they may be termed thermal, aluminous, hepaticized waters, with a portion of iron suspended in them.

All round the volcano this hepatic gas is poured forth from innumerable openings, like small chimnies, on the edges or sides of which pure flowers of sulphur are formed. This is a beautiful phenomenon, which probably arises from the vital air of the atmosphere decomposing this hepatic gas, and thereby depositing its sulphureous part. Drops of pure water were found hanging from these openings.

Now, when only a small quantity of gas is poured forth, the water is not so pure, but contains a small quantity of sulphur.

Medical properties of the Souffriere waters,

which are now, even in the winter, very warm.

BATHS and accommodations for sick people were built many years ago; which having been neglected for some time past, are now almost decayed. The water at the baths, as I observed before, rose Fahrenheit's thermometer to 106 degrees, but there is a bath where the water is received and allowed to cool to that degree of heat which is directed by the physician. The water is generally drank at about natural heat or 98°, but sometimes it is used when quite cold. The general effects of it are to promote perspiration when drank warm, and when cold it

appears

appears to act as antiseptic. The itch, scorbatic, and herpetic eruptions, and all cutaneous diseases are relieved, and most commonly removed entirely, by bathing twice a day for some time in the water, allowed to cool to the degree of natural heat. Rheumatic disorders of the chronic kind were greatly relieved, and sometimes cured by bathing. Anchylosis, rigid nodons, and stiffness of the small joints, when they did not proceed from a syphilitic cause, were cured by the douche, bathing, and drinking the waters. They have been employed very frequently in paralytic disorders, and in those proceeding from the dry belly-ach, which is occasioned by lead, as was observed before, they were very efficacious, seldom failing to effect a perfect cure.

In complaints of the stomach and bowels proceeding from the fumes of lead, in giddiness of the head, trembling of the limbs, tingling at the ends of the fingers, and other nervous affections, so common among house-painters, or among other people, occasioned by their living in newly painted houses, or drinking much new rum, the Souffriere

waters

waters drank lukewarm, three or four times a day, and bathing in them once or twice a day, contributed very much to alleviate, and sometimes removed them entirely. A good diet and exercise were used at the same time, but to restore the strength, and thereby complete the cure, the cold sea-bath was generally necessary. In the hemiplegia, or less violent paralytic affections, proceeding from an apopleptic attack, they were not found to be so beneficial, although drunk cold, and the bath used nearly cold. In one instance they proved evidently hurtful, but the bath was used hot, and the bad effects proceeded, probably, from that circumstance. In general, they may be employed for the same complaints, for which the Bath waters are ordered, and with equal advantage.

General Observations.

Near the middle of this Island on the top of a high mountain, there is a much larger volcano still burning, than that now described. It forms a hollow resembling a punch bowl, and occupies a space of ground equal

equal to 12 or 15 acres. A small river of hot Souffriere water issues from this volcano, having the same sensible qualities as those which have been analysed. I have seen and tasted the water near the sea-side, but the description of the place is from the information of people who have been on the spot, as a journey to a part of the Island so difficult of access was too fatiguing for me to undertake. In all our Windward and Leeward Islands, there have been similar volcanos, most of which are now burnt out; but their remains are easily discovered by the hot water that is poured forth at some distance from them, and by exploring the mountains, as Morne Agrou was in Saint Vincent, by Mr. Anderson, who has given a very accurate and ingenious description of a large volcanic crater in that mountain, in the Philosophical Transactions. There are hot waters in the Islands of Saint Christopher and Nevis, but the volcanos there have been extinguished long ago. Evident marks of different craters are to be seen in the mountains there, and also in the Island of St. Eustatius. Many small Souffrieres are burnt out in this Island, and also

in some of the other Islands, but they are not so hot as those in the Island of St. Vincent.

in Martinico and Guadaloupe. There are several volcanos still burning in these Islands, the waters of which resemble ours in every respect, and are employed for the cure of the same diseases.

In the Island of Guadaloupe particularly, there is a very large volcano, which throws out great quantities of lava, and can be seen smoking at a great distance.

The difference in the qualities of the hot waters of these Islands arises from the strata of earth and minerals that they pass over. In some there is probably a bed of clay, or calcareous or magnesian earth and iron ore. In our Island it passes through argillaceous earth, and this seems to be the case in all the Islands that I have visited, for they all abound with clay, and a variety of pottery is made in every one of them. All have pyrites, black sand, that is attracted by the magnet, or iron ore in some form or other. Sulphur is also always found near and in the burning volcanos, and all pour forth the same hepatic gas. Large quantities of sulphur

heat without cracking or flying, are called
 fire-stones, and are used for hanging of
 building coppers and kails for boiling of rum
 and distilling of rum. The tufa or lava
 found near the openings of old volcanos, is
 very light and spongy, generally of a pale
 white or reddish colour, and in places where
 it has been long exposed to the air, it is
 mouldered into a sort of soft gravel. Coral
 rocks are found at a great height above the
 surface of the sea, all round the sea coast of
 these Islands; sometimes in Arata covered
 with earth, but more frequently in large
 masses; from which, by burning, lime is
 made. Coral rocks are always formed at
 the bottom of the sea, by the petrification,
 or incrustation of coral, sea-weeds, and other
 submarine plants.

Earthquakes have not been so frequent
 nor so violent for these twenty years past, as
 they were formerly, according to the ac-
 counts given of them by the oldest inha-
 bitants.

How

How these subterraneous fires are generated in the bowels of the earth, is a question of very difficult solution; the discussion of which I shall not presume to enter upon at present, although I may make some attempt of that kind, when I am more at leisure.

F I N I S

In page 18, dele "violent."

Do 115, for "which" insert "and."

Do 116, insert "the" before "infant."

A P P E N D I X.

EXPERIMENTS

ON THE

CINCHONA BRACHYCARPA.

By MR. BRANDE,

APOTHECARY TO THE QUEEN.

1st. **W**ATER and spirit distilled from it, became slightly impregnated with a peculiar aromatic flavor, not discoverable in any other preparation.

2d. The decoction zij to zvj of water boiled to ziv is of a deep color, clear, and possesses the whole flavor of the bark; on cooling it becomes turbid, and deposits a powdery sediment, but less in quantity than the common Peruvian, the yellow, or angustura bark, which, as in these, is again nearly soluble by the addition of the vegetable or mineral acids, &c. *

3d. The infusion zij to ziv of boiling

* I had not observed the importance attached by Dr. Relph, to the property possessed by the decoction of the yellow bark, of remaining sound a much longer time than either that of the common or red bark, till within a few days of the above being sent to the press, therefore had not time to compare the cinchona brachyocarpa, with it in this respect. *Vide his Inquiry, &c. p. 133.*

M

water,

water, appeared equally strong as the decoction, and remained clear.

4th. On 3ij were poured 3iv of cold water, and frequently shaken during twelve hours, then strained; this infusion appeared nearly of equal strength with the above; three fresh portions of water were then poured upon the bark, and being strained were mixed together. Two ounces of rectified spirit were added to the residuum, which, after digesting eighteen hours, had extracted very little taste or color.

5th. The tincture one ounce to four of rectified spirit (which was afterwards used for the resinous extract) was deep colored, but with little taste.

6th. Proof spirit is a good menstruum; but spirit diluted with three or four parts of water is the best.

7th. Solutions of pure, and carbonate of potash, extracted deep tinctures, but less so than those of ammonia.

8th. Dilute sulphuric acid extracted a very slight taste and color.

9th. Distilled vinegar dissolved but little.

10th. Sp. ætheris vitriol extracted very little.

11th.

11th. *Sp. atheris nitros.* is a somewhat better; by no means a good menstruum.

12th. Lime-water made an infusion of a very deep color, but without much taste.

13th. One drachm rubbed with 30 grains of lime, yielded ammonia scarcely sufficient to be smelt, but enough very sensibly to whiten the fumes of muriatic acid; on this mixture were poured two ounces of cold water; the infusion, after standing 24 hours, was of a deep red color, without much flavor.

14th. One drachm was rubbed with an equal quantity of pure magnesia; the same was done with carbonate of magnesia; and four ounces of boiling water gradually added to each: having stood 12 hours, the former appeared somewhat stronger, the latter perhaps weaker than a common infusion; the former gave the darkest precipitate with solution of iron, but not more so than the common decoction.

15th. Compared with equal quantities of infusions of the common, the yellow bark, and galls, it appeared to contain evidently more astringent matter than the two former; less than the latter.

16th. The cold infusion, No. 4. yielded

on evaporation 53 grains of a clear, bitter, dry extract.

17th. Two ounces gave, by pouring boiling water over them in a flannel bag, as long as it received either taste, or color, and gentle evaporation, 3 vij. gr. v. of a pilular extract.

18th. The tincture (No. 5.) yielded on evaporation 69 grains of a hard extract, nearly soluble by trituration in hot or cold water, the residuum of bark was boiled in a quart of water to three ounces, strained and evaporated to the consistence of honey; to which was added the resinous part, previously dissolved in a little alcohol, and the evaporation continued nearly to dryness, when the whole weighed four drachms five grains.

19th. One ounce distilled alone in an earthen retort, produced pyrolygnous acid, empyreumatic oil, and other gasses, the properties and quantities of which I was prevented from ascertaining, by an accident which befel my apparatus. The residuum burnt in the retort to a coal weighed 3ij. gr. viij.

20th. On the 128 grains of coal in the last experiment, were poured eight ounces of boiling distilled water; after standing a short time

time the solution was filtered; to different portions of which were added several tests, of these exotic acid, nitrate of silver, and muriate of barytis; each formed a milky precipitate.

21st. On the coal left behind was poured some dilute sulphuric acid; this passed through a filter, gave prussiate of iron on the addition of prussiate of potash, but discovered nothing else to any test made use of.

22d. From the same quantity of coal obtained, as in No. 19. by the addition of distilled water, filtration, and evaporation, I obtained six grains of the following salts: sulphate of potash, muriate of potash, carbonate of potash and lime, perhaps pure. The iron also in No. 21. was in very small quantity.

The following Table will shew the quantity of soluble or extractive matter obtained from this and the other barks now in general use, for which I am indebted chiefly to Mr. Babington's Letter in Dr. Relph's Treatise on the Yellow Bark; some allowance is perhaps to be made for the different consistence to which each extract may have been evaporated. I must also remark, the quantity of extract I obtain from common Peruvian bark, either aqueous or spirituous, is constantly greater than that mentioned by
Mr.

Mr. Babington, generally amounting from three to four ounces out of twelve.

From	By cold water.	By boiling water.	By rectified spirit.	By spirit and water.
Cinchona Brachycarpa was obtained.	3ij. 53 gr.	3ij. 3viij. gr. v.	3j. 3i. gr. ix.	3j. 3iv. gr. v.
Angustura bark.	3iv. 3vi. ʒij.	℥j. 3vi. 3iv. ʒij.	3iv. 3iv.	℥j. 3viij. ʒij.
Yellow Peruvian bark.	℥v. 3xv.	℥x. ℥iv. 3ij.	3xij. 3xij.	℥j. 3iv.
Red bark.	— —	℥x. ℥iv. 3i.	— —	℥j. 3ij. ʒi.
Common Peruvian bark.	— —	℥x. ℥ij. 3ix.	— —	℥j. 3ij. ʒi.

It is presumed that every pound mentioned here, is that of the Apothecary's or Troy weight.

To ascertain its power of preventing and correcting putrefaction, several experiments were made with a great variety of substances, of which it will be sufficient to observe, that the *cinchona brachycarpa* was generally found nearly equal to any as a preventive, inferior to the *angustura* as a corrective of putrescence; it coincided very much with the yellow bark, both of which possess, in this respect, qualities somewhat superior to the common Peruvian.

Having ascertained thus much, I shall only insert the following experiment:

Seven phials, each containing 3ij. of fresh sheep gall and 3ij. of water were numbered; to the first was added 10 gr. of fine powdered *cinchon. brachyc.* to the second, 10 gr. of *angustura*; to the third, the same of yellow bark; to the fourth, an equal quantity of fresh burnt charcoal, and three were left without any addition, as standards or for future use.—These were placed together by the side of a fire, where the medium of heat for 16 or 18 hours of the 24, was about 96 degrees of Fahrenheit's thermometer, and frequently shaken.—At the expiration of 20 hours, 1, 2, 3, 4 were quite sweet;

5, 6, 7 smelt very bad; to No. 5, 10 grains of cinch. bark, were added; to No. 6, of angustura; to No. 7, of yellow bark, the same quantities.

44 Hour—all were sweet.

56 Hours—No. 3, 4, and 6 were becoming offensive, the rest were sweet.

68 Hours—No. 2 and 6 remained sweet, the others all smelt very offensive—No. 4 considerably the worst, to which were added six grains of the substance each already contained.

24 Hours had elapsed before they were examined again, when 1 and 2 were sweet, 3 smelt a little, 4 was very bad, 6 remained perfectly sweet, 5 and 7 were again becoming putrid, but no other alteration appeared to have taken place after several hours.